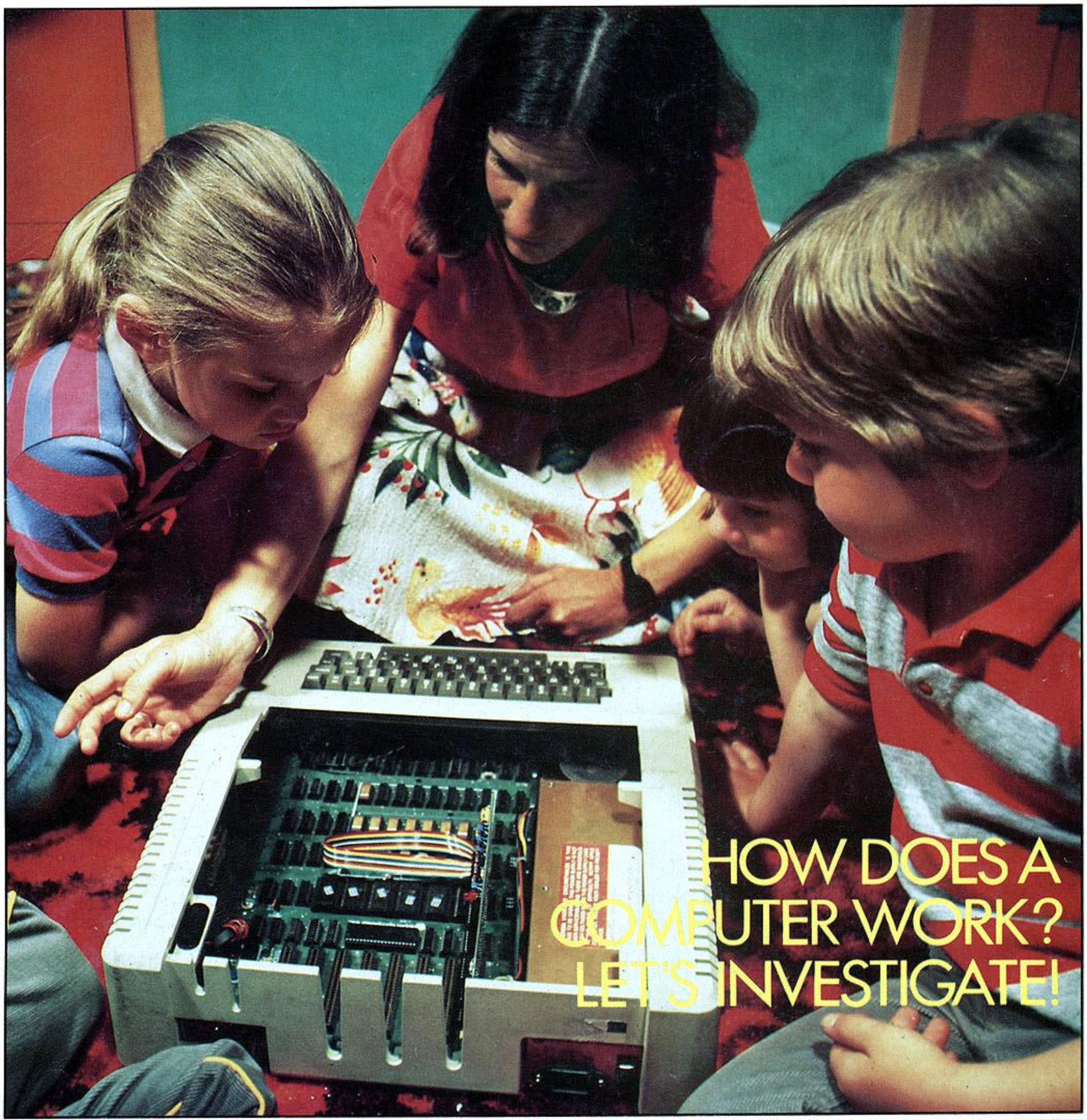
CHARTER ISSUE $3.50

Scholastic's Magazine for Today's Elementary Classrooms

TEACHING and computers

Published by Scholastic Inc. September 1983



HOW DOES A COMPUTER WORK? LET'S INVESTIGATE!

A School Where Everyone Programs in PILOT · What's Your Computer IQ?

Plus, a Bonanza of Back-to-School Ideas!

```
10 REM COUNTING PROGRAM
20 LET K=0
30 LET K=K+1
40 PRINT K
50 GOTO 30
```

```
RAY
>10 REM COUNTING PROGRAM
>20 PRINT "HOW HIGH SHOULD I COU
NT"
 30 INPUT H
>40 PRINT "WHAT SHOULD I SAY WHE
N I'M DONE".
>50 INPUT A$
>60 FOR K=1 TO H
>70 PRINT K
>80 NEXT K
>90 PRINT A$_
```

Over 125,000 Educators Have Attended Our BASIC Computer Programming Sessions Free of Charge . . .

. . . How About You?

Whether you realize it or not, computers play a major role in our daily lives. Indeed, the importance of their role in business, government and education is increasing with every passing day. That's why in school districts across the country, more and more teachers and administrators are finding that microcomputers are important instructional tools for students at all grade levels and in all subjects.

Today's students are responding to computers in a way that would never have been dreamed of just a couple of years ago. Many kids even have a computer at home that they can—and do—use on their own. They are learning *about* computers by *using* computers—preparing themselves for the demands of today's world and the future. Clearly, as an educator, you need to prepare yourself, too.

Where Can Educators Turn for Help?

So how will you handle your role in classroom computing? Will you depend on others to bring this technical revolution to your school and students? Or will you join the more than 125,000 teachers and administrators who have become "computer literate" at their nearby Radio Shack Computer Center? It's easy to do. There are new training sessions starting all the time. You can even put together a class of people from your school or district. The staff at a Radio Shack Computer Center will be happy to arrange times that are convenient for you.

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This 10-hour intermediate session prepares you to write moderately complex programs. Some programming knowledge is required, such as our "Introduction to BASIC". Normal cost is $99.95 per person, but it's free of charge to educators.

Educator's Workshop

A general introduction to microcomputer applications in the classroom, how computers are being used and what courseware is available. This 3 to 4-hour workshop assumes no prior computer knowledge. The normal cost is $59.95 per person—no charge for educators.

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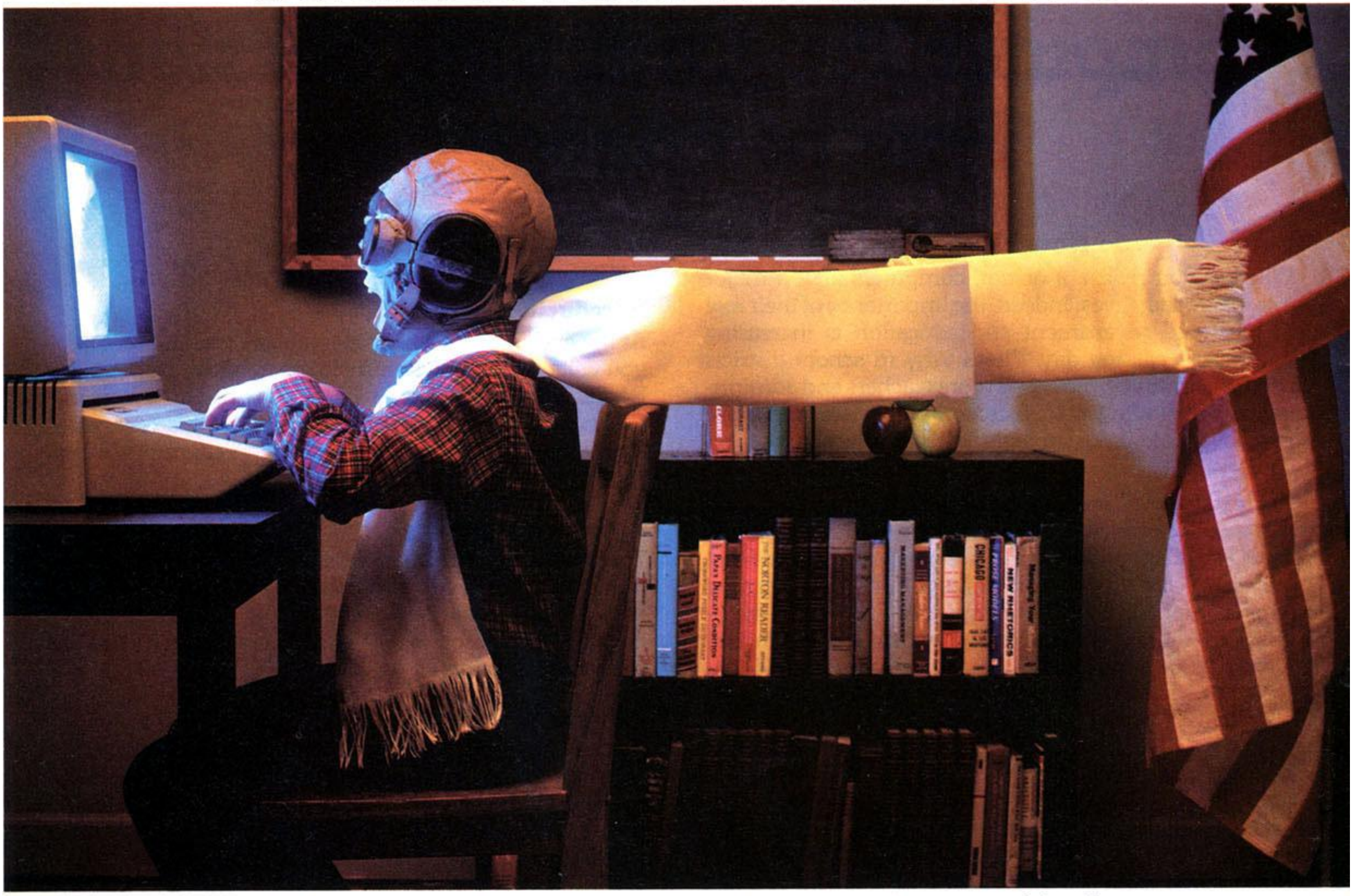
CIRCLE 11 ON READER SERVICE CARD

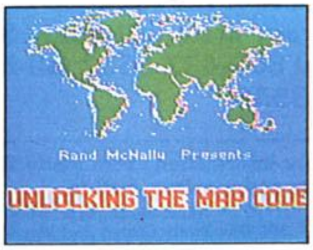
JEFF REED THOUGHT GEOGRAPHY WAS BORING UNTIL HE STARTED FLYING AIRPLANES.

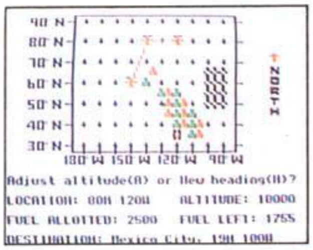


Rand McNally's new electronic learning program, *Unlocking the Map Code,* does something that's rarely been done before.

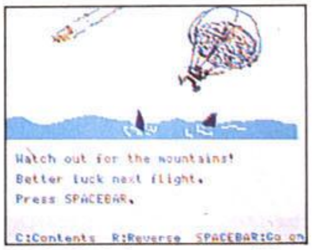
It makes geography exciting for Grades 4-6.

After mastering six map and globe skill exercises, students apply their knowledge to the "Simulated Flight Plan." Mountains, limited fuel and other obstacles challenge young navigators who can choose from twelve different flight plans, including Rome-to-Jakarta and Bombay-to-Moscow.





```
Adjust altitude(A) or New heading(H)?
LOCATION: 60N 120W      ALTITUDE: 10000
FUEL ALLOTTED: 2500     FUEL LEFT: 1755
DESTINATION: Mexico City, 19N 100W
```



```
Watch out for the mountains!
Better luck next flight.
Press SPACEBAR.

C:Contents  R:Reverse  SPACEBAR:Go on
```

The six exercises introduce students to basic map and globe skills including "Land and Water Forms," "Interpreting Color and Map Symbols," "Direction," "Location," "Scale," and "Time." Colorful maps and imagery plus a user-friendly system make this program a stimulating supplement to your usual course work.

Unlocking the Map Code. A comprehensive, interactive software package including Teacher Guide, Student Worksheets, Pre and Post Tests and two Floppy Disks for both the Apple II and Atari 800 computers. To learn how you can make geography anything but boring, call 1-312-673-9100 or your Rand McNally representative. And look for our two new geography programs for Grades 7-9 coming this fall.

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Educational Publishing: Software Division

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TEACHING and computers

Charter Issue • September 1983

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By Sandra Markle
"How does a computer work?" The next time a student asks you that question, don't hem and haw. Try these investigations with your class and learn firsthand how a computer processes information.

18 Every Teacher Is a Computer Instructor; Every Student Is a Programmer.
By Shiela Swett
When teachers at Evans School in Yeadon, Pennsylvania, first bought their 15 computers, the principal decided not to hire a computer specialist. Instead, *all* of the teachers became computer instructors. And, in turn, they taught *all* of their students to program in a computer language called PILOT.

23 What's Your Computer IQ?
By Lorraine Hopping
Are you a computer ace or do you need more input? Take this playful but instructive quiz and find out where you rank on the computer literacy scale.

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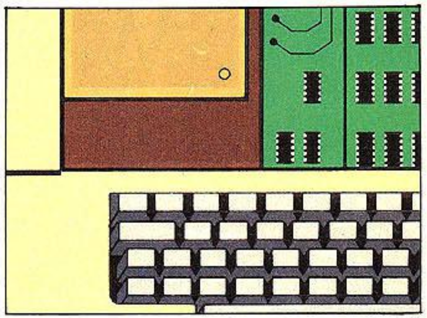

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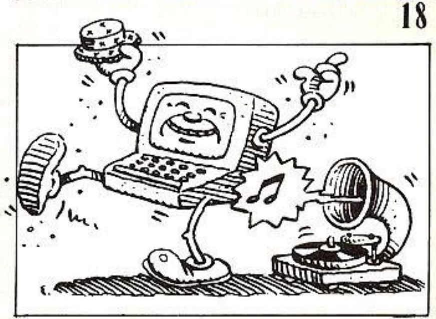

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An annotated bibliography for computer teachers.

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Taken at Lawrence Hall of Science, Berkeley, CA.

CIRCLE 12 ON READER SERVICE CARD

From the Editor

Welcome Back to School!

IT'S TIME TO GET READY for the most important and challenging job in the world. It's time to set up your room and organize your materials for a brand new year of teaching!

Our brand new magazine, *Teaching and Computers*, will give you all the support you need to make computers a significant part of this year's instruction. It's a magazine that keeps teachers up-to-date on computers, that helps teachers teach kids all about computers, and that provides ideas for using computers in the curriculum.

September's issue is jam packed with computer tips, teaching units, reproducible worksheets, activity cards, and bulletin board ideas.

Decide now to devote a special corner in your room to computer learning, and we'll help you keep it attractive and buzzing with activity. To start, decorate it with our giant-size **Electronic Calendar**, that contains lively computer activities, page 49. When the month ends, flip the calendar over and display the colorful poster, **What are the Parts of a Computer?**

No center is complete without task cards, so task cards are what you'll get each month in a column called **Learning Center**, page 26. This month's cards introduce students to the computer keyboard.

If you've ever caught a child lifting up the back of a keyboard to see what's inside the computer, you'll especially appreciate our feature story, **Close Encounters with the Inside**, page 15. In it, contributing editor Sandra Markle outlines four projects that will help your class discover how a computer works inside.

A computer program that really works is the one at Evans School in Yeadon, Pennsylvania. "Would you believe all of the students can program!" contributing editor Shiela Swett told the *T & C* staff. "They use a computer language called PILOT, which up until now, was considered a language for teachers." You'll find Shiela's report **Every Teacher Is a Computer Instructor; Every Student Is a Programmer** on page 18.

If you're wondering just how computer aware you are, take the quiz, **What's Your Computer IQ?**, on page 23. It's a zany, but educational test that assistant editor Lorraine Hopping put together with the help of our advisory board members.

There's lots more in this month's *Teaching and Computers*. Don't miss our software recommendations, computer news update, Logo lesson, and program of the month.

We hope you enjoy our charter issue and that you'll let us know how we can help you in teaching with and about computers.

Mary Dalheim

TEACHING and computers

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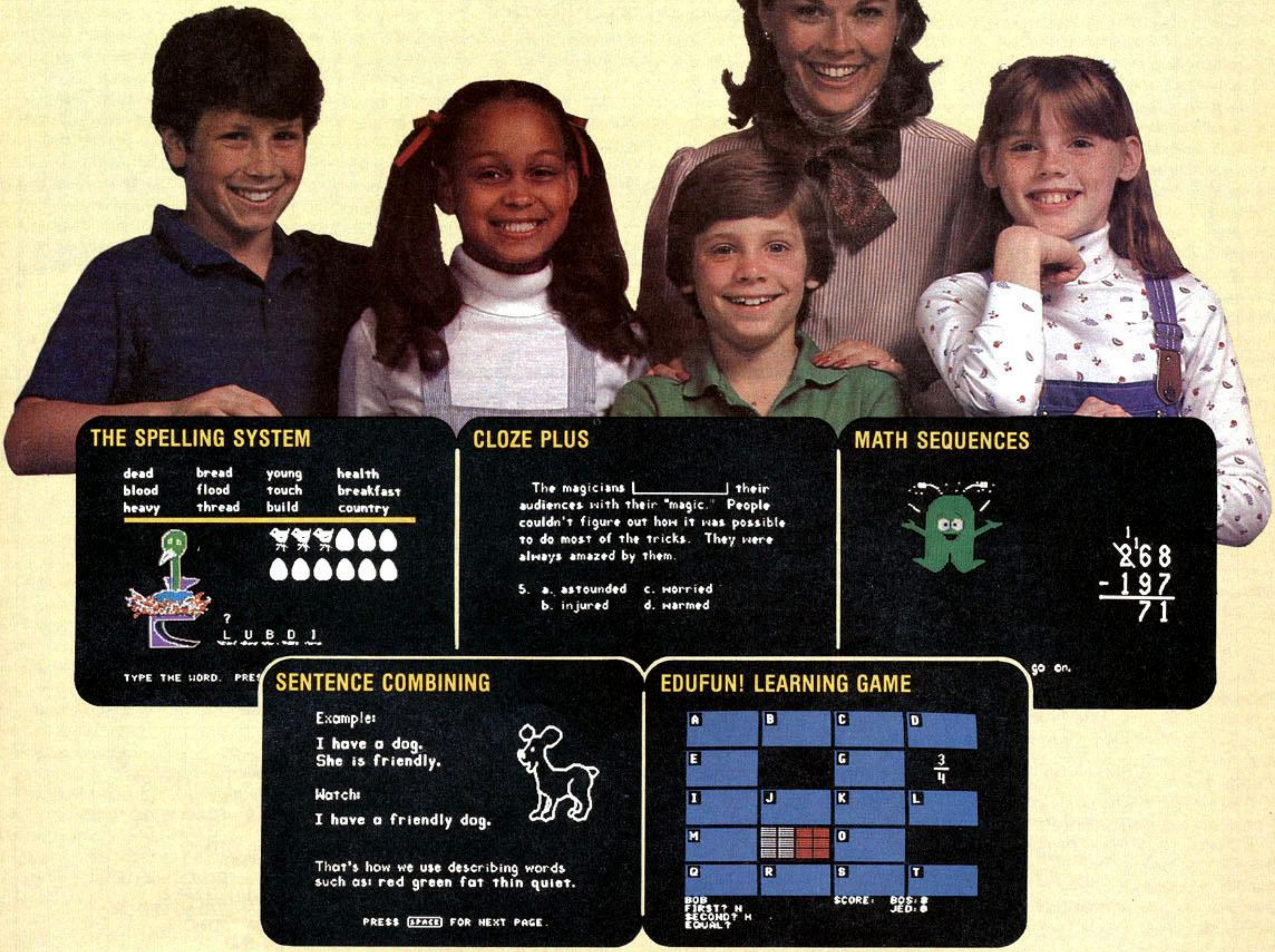

THE SPELLING SYSTEM

dead bread young health
blood flood touch breakfast
heavy thread build country

?
L U B D I

TYPE THE WORD. PRES

CLOZE PLUS

The magicians [ ] their audiences with their "magic." People couldn't figure out how it was possible to do most of the tricks. They were always amazed by them.

5. a. astounded c. worried
b. injured d. warmed

MATH SEQUENCES

268
- 197
71

go on.

SENTENCE COMBINING

Example:

I have a dog.
She is friendly.

Watch:

I have a friendly dog.

That's how we use describing words such as: red green fat thin quiet.

PRESS SPACE FOR NEXT PAGE.

EDUFUN! LEARNING GAME

BOB
FIRST? H
SECOND? H
EQUAL?

SCORE: BOS: 8 JED: 8

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CIRCLE 8 ON READER SERVICE CARD

Idea of the Month

MAKE YOUR OWN USER'S MANUALS

by Mindy Pantiel and Becky Petersen

"HOW DO I SAVE MY WORK ON A DISKETTE?" "How can I get the cursor to move over *there?*" "Which keys make capital letters?

How many times a day do you hear these and other computer questions? It's frustrating for you to answer so many questions, so many times; it is equally as frustrating for students, who have an immediate need to know the answers to their questions, to have to wait until you are free to help them.

What is really needed is a user's manual for kids—one that students can go to and quickly find answers themselves to hardware or software problems. Commercial computer manuals for children are rare. But kids can make their own manuals. Here's how in seven easy steps:

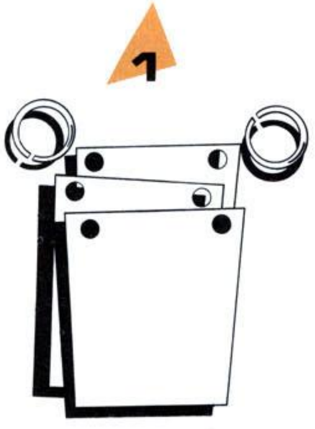
1. Give each student two pieces of heavy cardboard (approximately 4″ × 8″) to serve as bookcovers.
2. Have kids turn the bookcovers so that the books will be 8″ tall and 4″ wide, then punch two holes in the top of each cover.
3. Punch identical holes in the top of 20 half-sheets of white paper and slip the papers between the bookcovers.
4. Fasten a metal ring through each set of holes so that the book looks like a stenographer's pad.
5. Using felt-tipped pens, draw a design on the cover.
6. Inside the book, encourage students to list program commands, operating instructions, and short programs as they encounter them. Students might even use colored paper dividers to organize their manuals into categories such as: Working the Computer, Computer Terms, Program Commands and Programs.
7. Stand the manuals up next to the computer—ready for quick, flip-through access.

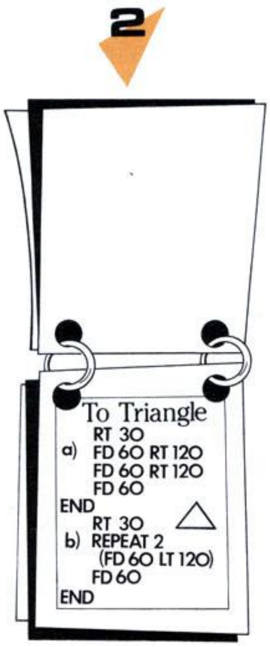
Review your student's manuals occasionally. They'll help you evaluate individual progress on the computers. You might even encourage kids to take the manuals home for parents to see what you're working on in school.

If your students are studying more than one computer language, say, Basic and Logo, have them make a user's manual for each!

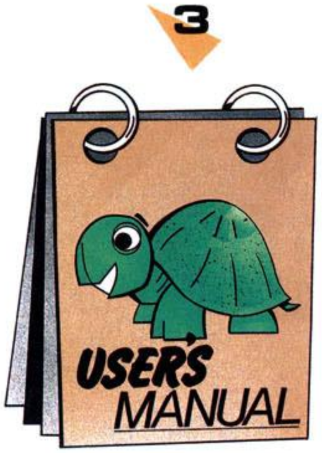
Students can answer many of their own computer questions when they have user's manuals made especially for them—by them!

Mindy Pantiel and **Becky Petersen** teach Logo to elementary students.





```
To Triangle
   RT 30
a)  FD 60 RT 120
   FD 60 RT 120
   FD 60
END
   RT 30
b) REPEAT 2
    (FD 60 LT 120)
   FD 60
END
```



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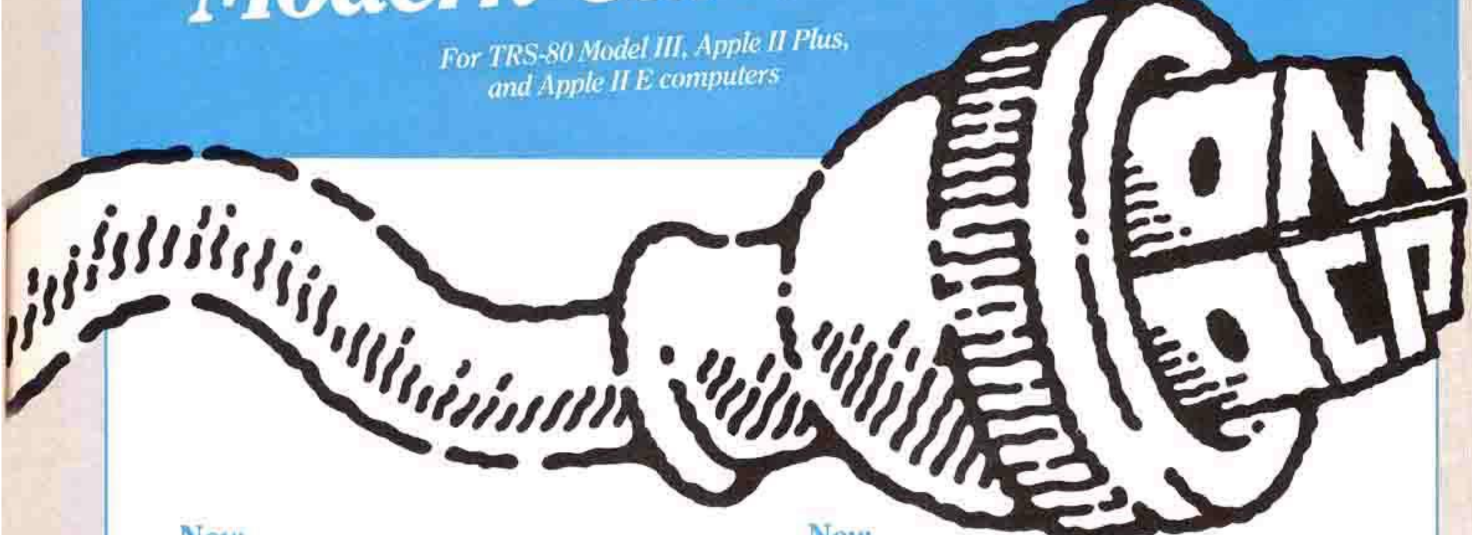

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MICROPOWER Math Skills Software.

Name ____________________
(Please print)
I teach ____________________
School ____________________
School address only ____________________
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CIRCLE 9 ON READER SERVICE CARD

Update

News for Computer-Using Teachers

MECC Converts 100 Items for Commodore

One hundred items in the Minnesota Educational Computing Consortium (MECC) library of courseware and print material will be available for the Commodore 64 computer this winter. Content areas include biology, music, math, reading, computer literacy, nutrition, language arts, English, and spelling. Programs will be distributed by Commodore through retail stores and by MECC to schools.

Micros Improve School Atmosphere

The computer's greatest impact is in improving the social atmosphere of the classroom, say teachers in a survey conducted by Johns Hopkins University. Thirty percent of the teachers say the computer produces "much more" general enthusiasm for school; 18 percent report that students work "much more" independently; and 15 percent say that students help each other "much more" with classroom exercises. Teachers also say that the computer improves the performance of "above average" students more than others.

Chicago Teachers Get Computer Training

All 22,000 teachers in the Chicago public schools system will attend a one-day, six-hour computer training session by the end of the school year. One-hundred teachers per day will be divided among five sites forming the nation's largest inservice program for computer literacy. Teachers will learn how computers work, how they affect our lives, and how to program.

Computer Literacy Required for Utah Teachers

All K-12 teachers and administrators hired in Utah after this school year must be certified in computer literacy. The Utah State Board of Education approved the proposal which does not affect the state's 20,000 currently employed teachers and administrators. But the board is taking steps to increase computer literacy among all educators.

NEA Enters the Software Business

The National Education Association (NEA) will assess, endorse, and market computer software in collaboration with Cordatum, Inc., a Maryland-based firm. The new program, called the "NEA Educational Computer Service," will examine and catalog software prepared by both commercial and nonprofit publishers. The service also will publish and distribute software submitted by teachers.

VDTs Do Not Cause Serious Eye Damage

Contrary to recent reports which linked Video Display Terminal (VDT) use to a higher risk of cataracts and other eye problems, a new study by the National Academy of Sciences says that there is no evidence that VDTs cause serious eye problems. In fact, the study states, radiation from VDTs is less harmful than fluorescent lights or sunshine. But after prolonged use, VTDs can cause some discomfort, including eye strain, blurred vision, and headaches.

First Used-Software Exchange Opens

The first national clearinghouse for used software has been established in Montclair, New Jersey. Called the National Software Exchange, it permits people all over the country to trade software. Membership costs $75 each year. Members can submit for trade any game or educational program for any of the popular computers, accompanied by all documentation. In exchange, the service will return any requested program for a $5 service and handling charge. Contact: 201/783-6000.

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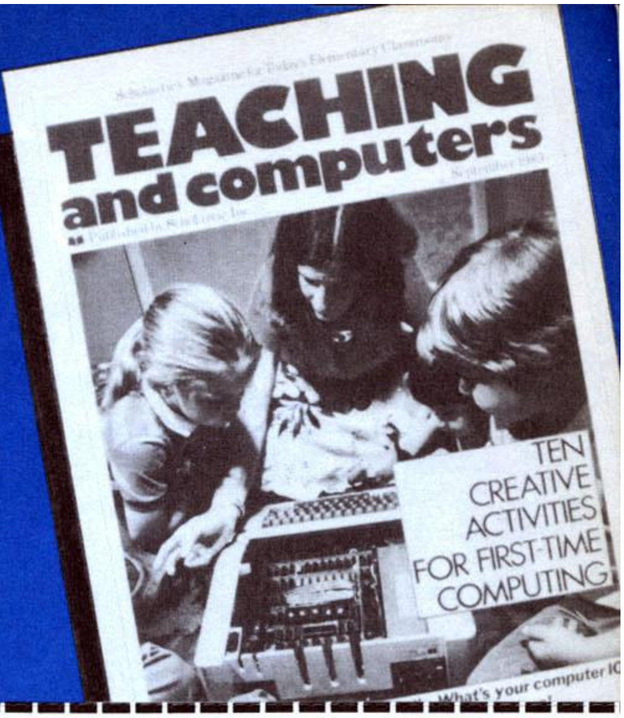

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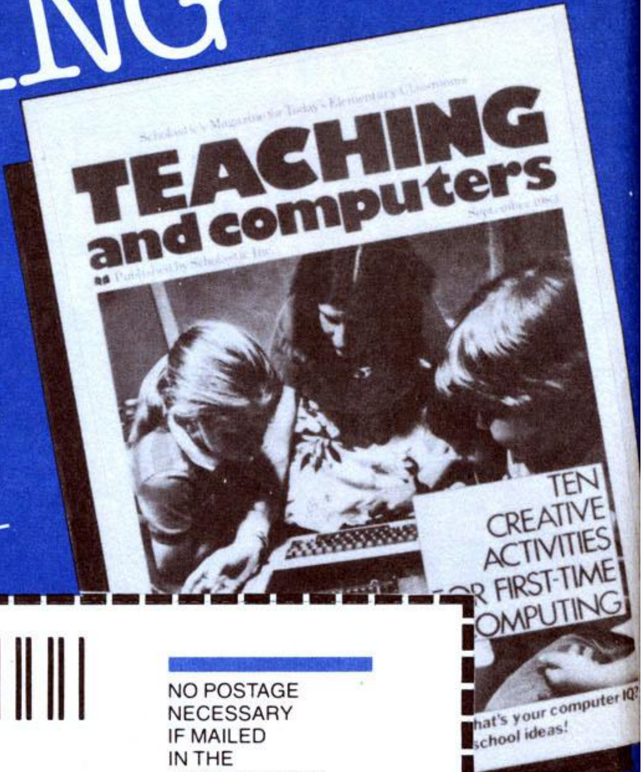
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Teacher Talk

my classroom helper

By Thomas Staples

Thomas Staples is a sixth grade teacher at Brackett Elementary School, Pease Air Force Base, Portsmouth, NH.

"a trainer is going to visit your class," they said. "She will help you teach the curriculum and track class performance."

I remember feeling a bit apprehensive about having an intruder in my classroom, but the researchers said I could dismiss her at the end of the year if things didn't work out.

The following Monday, the trainer arrived early and announced that she would present today's math lesson. I had carefully prepared a math lesson for the period, but I noted that she had all the bases covered. In fact, her own preparation material was meticulous.

I was doubly impressed because she was very young and, presumably, new to teaching.

I offered to brief her on individual problems and learning levels and to introduce her to the class. She declined, saying that she caught on quickly to individual weaknesses and would prefer that students introduce themselves to her directly.

Having taught for dozens of years, I was not only surprised, but a bit aggravated as well that such a newcomer could be so confident.

When the class came in, the trainer sat quietly in the corner. Following her instructions, I plunged right into the reading lesson without introducing her.

Despite my efforts to put more fervor into my teaching, the children couldn't keep their eyes off her throughout the period. I began to resent her presence.

At 9:45 sharp I announced that it was time for math. The trainer met each student individually and quickly proceded with the lesson. My students and I dropped our jaws in amazement. She never forgot a name and paced her instruction so that each child could achieve success.

I was crushed. She made no mistakes whatsoever. I dismissed the children for recess and went directly to my principal. I told him what had happened and how humiliated I felt. He asked whether the trainer would be able to attend to all the personal interactions and diverse activities that went on all day in my class. I smiled and said that, no, she probably couldn't do that; but I still felt as if I had been upstaged.

When math period came around, the trainer's performance was, again, flawless. She was quick, correct, perfect in her instruction. She excelled not only in math, but also announced that she could teach English, social studies, language arts, and science.

I felt as if all I was good for was collecting lunch money and handing out tissues. But as soon as I decided to make the best of it, seeing as I was stuck with her for the year, I began to look for ways in which I could use *her* to compliment *my* teaching. After all, I was still the boss.

As the year progressed, I found that I could depend on her more and more to reinforce lessons that I had taught in class and to correct all the tests. This gave me more time to give my children the human interaction they needed. I did more observing and evaluating of students and provided them with important personal feedback.

By the end of the year, I had learned to make use of all her talents and, despite my initial skepticism and reluctance to allow her in the classroom, she and I had slowly become the best of friends. In fact, with my wife's consent, we even began meeting after school and on weekends to share our knowledge.

Needless to say, I have eagerly signed her up for another year. I wouldn't want to be without the best teacher's aid I've found in years—my computer! ☐

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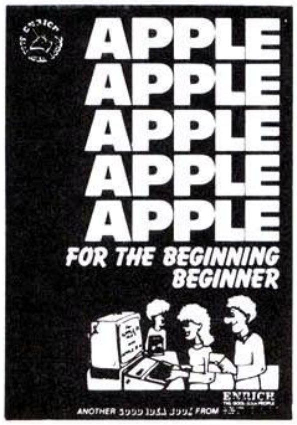

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Question Corner

DO YOU HAVE A COMPUTER QUESTION? Ask an expert; ask Molly Watt. Molly was a teacher and school administrator for 20 years before the computer bug bit. Now she conducts in-service workshops on computers and writes articles and software evaluations for national publications. She is currently writing a book about teaching Logo.

Send your computer questions to Molly in care of *Teaching and Computers*, 730 Broadway, New York, NY 10003.

Dear Molly: Help! I am an elementary teacher with one computer in my classroom and 30 kids. How do I provide instructive computer experience for all 30 children?

Martha Rhodes
Des Moines, Iowa

INTRODUCE your one computer with a lesson that will involve the whole class. Software simulations are usually easy to use with groups. I recommend *Lemonade* (published in various forms by several companies). It's a simple program that allows the class to simulate operating a lemonade stand. Make sure each student gets a chance to input something on the keyboard during the simulation.

There are many simulation programs available for classroom use. Some other simulations include *Snooper Troops* series (published by Spinnaker Software), *The Search Series* (published by McGraw Hill), *The Oregon Trail*, and *Odell Lake* (both available from many publishers).

Another way to provide hands-on experience with 30 kids in your class is to set up a learning center. Two or three students can use the center at a time for purposes that support your curriculum goals. You might even provide worksheets or activity cards.

Illustration by Patrick McDonnell

Above all, I suggest that you get together with other teachers in your school and share your experiences. This is a new field and we are all learning together.

Dear Molly: I've heard a lot about the advantages and disadvantages of various computer languages. Which one should I introduce to my students? P.S. They don't know a thing about programming!

Susan Weldon
Chicago, Illinois

I WOULD START with Logo. Developed at M.I.T. (Massachusetts Institute of Technology), with National Science Foundation funding, the Logo language lets students learn to program a computer almost naturally! To program the computer, a beginner can direct commands to a small triangle, called a turtle, located in the middle of the monitor. The turtle moves forward, back, right, or left when the user types in these words at the keyboard.

Children as young as three years old can manipulate the turtle by typing commands at the keyboard. Third and fourth grade students can direct the turtle to make any shape they can draw on paper. It just takes a little estimating, experience, and trial and error!

You will soon discover that Logo can do more for you than let you draw pictures with a turtle. For example, Logo can be used to write poetry, organize information, alphabetize lists, run guessing programs, and explore physics. Logo is not just a good language with which you can continue. Experienced users say that Logo has no threshold, no ceiling.

Dear Molly: The principal of our elementary school has just informed me that we have the funds to purchase 10 computers. I am in charge of recommending the best computers for our school. Should I buy the same type or several different types of computers?

Robert Neuman
San Diego, California

THAT DEPENDS on what you want to do with your computers. For example, perhaps the K-3 teachers want to use Logo turtle graphics, while the fifth and sixth grade teachers want to teach BASIC programming, and the librarian wants to set up a word processing learning center for producing book reviews. These conflicting intentions may necessitate choosing two or three different brands of computer hardware.

But, if it is possible to meet your educational goals with one kind of computer (check with dealers), I would strongly recommend buying 10 of the same kind for two reasons. First, software is not like a phonograph record. It is machine specific. Software for the TRS-80 only runs on the TRS-80. And software for Texas Instruments only runs on Texas Instruments. Because most software is expensive and therefore must circulate between departments, having several kinds of computers can be very confusing.

The second reason I would try to buy one kind of machine is that if you are using the computer to teach programming, each machine has a slightly different version of the language. These variations make it difficult to create curriculum materials that can be used in all language versions without some minor corrections.

Dear Molly: This fall, the school budget allows us $400 for purchasing software. There are so many different programs that we don't know where to begin. What should we buy?

Martha Bingham
Hartford, Connecticut

THERE ARE four learning categories you should try to represent with software. The first type teaches how to use the computer. The second kind uses the computer to teach curriculum subjects. A third type lets students use the computer as a tool to produce something. And the fourth type uses the computer for educational games. Here's what I would buy for each category:

1. Using the Computer: I suggest a Logo program, which can be used by students of every age to learn programming.
2. Curriculum: I recommend a program like *Rocky's Boots* (published by The Learning Company) which teaches logic.
3. Tool: Consider a word processing program which can be used easily by young students. My favorite is *The Bank Street Writer* (published by Scholastic Inc.)
4. Educational Games: A game like *Mix and Match* (published by The Children's Television Workshop) is a good purchase because it teaches fun games that also can be played without a computer.

If you have money left, I would use it to buy blank disks and paper for a printer if you have one. ☐

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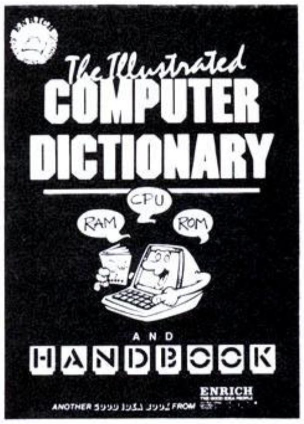

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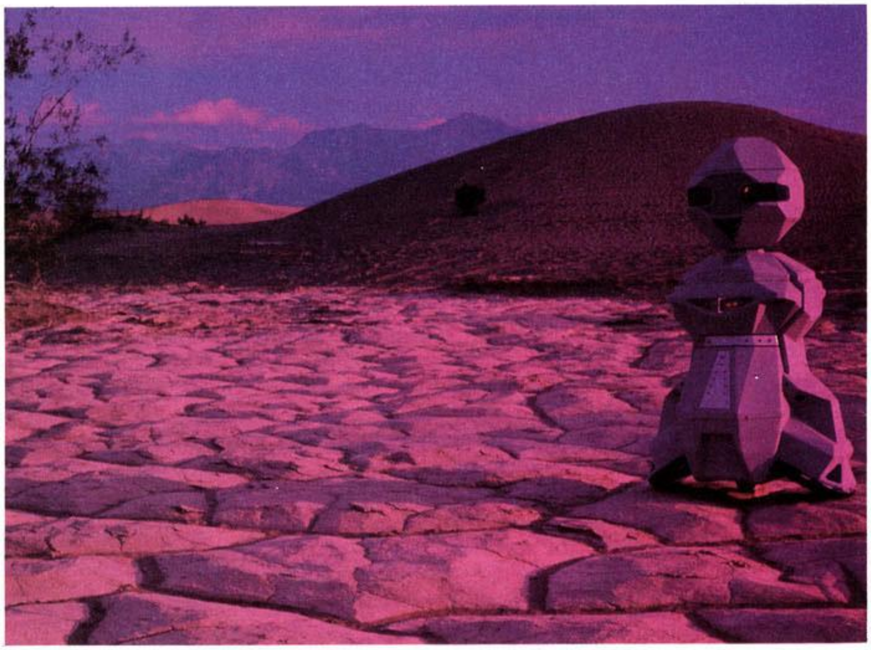
Classroom Happenings

EVERY MONTH IN THIS column we'll talk about exciting computer activities that are happening in classrooms across the country. If your class is working on an interesting project, we'd like to hear about it. Write to: Classroom Happenings, *Teaching and Computers*, 730 Broadway, New York, NY 10003



ANDROBOT, INC.

ATHLETICS AND ROBOTS

What do you call an event where teams of six children use Logo to program a robot named Topo around an obstacle course as quickly as possible? Teachers at Stevens Creek Elementary School in Cupertino, California, call it a Topo Olympics. The kids who program Topo the fastest are called the champs!

The kids love their new 3-foot-high friend. They even dress "him" in Izod shirts and gym shorts so he looks like one of them.

Curriculum Coordinator Jenny Better says Topo is easy to operate. You just hook Topo to a computer and either program him to move or control his movements with a joystick. "The neat thing is that kids can actually see concepts in action when they program Topo," says Better.

GUTEN TAG
おはよう ございます
BON JOUR

Topo came to Stevens Creek after principal Harvey Barnett asked its manufacturer if the school could be a pilot test site for Topo.

You can get your very own Topo at most computer stores. Topo costs $495 without sound, $795 with sound. For more information, contact: Androbot, Inc., 1287 Lawrence Station Rd., Sunnyvale, CA 94086.

AN URBAN ADVENTURE

You enter the public library. You may:

1. Say hello to the librarian.
2. Ask what time the library closes.
3. Ask where the books are.
4. Renew your library card.

This is a scenario from the Urban Adventure game created by gifted and talented bilingual students (grades 3-6) in Hartford, Connecticut. The game teaches problem solving and language skills, along with practical information about Hartford's educational resources.

Teacher and project director for Hartford's bilingual gifted and talented program Daniel Barstow actually programmed the software after the kids designed the graphics and helped him format the game. Using speech synthesis, they translated the program so students could learn correct pronunciation of target vocabulary words in both English and Spanish.

Among other things, the game teaches children to locate the public library on a map, use the card catalog, and check out books, films, or records.

Urban Adventure is a project of Lighting a Flame (*Encendiendo Una Llama*), a federally funded program that serves approximately 175 bilingual children in grades 3-6.

If you and your class are interested in turning your city into an adventure game, write to Barstow for information and advice at The Bilingual Gifted and Talented Program, Barnard Brown School, 1304 Main Street, Hartford, Connecticut 06103.

LOGO PENPALS

Here's something fun you can do in your classroom: join the Logo Class Penpal Network. Teachers and students who join the network are matched with counterparts from various regions of the USA, Canada, or one of several overseas countries. During the school year, classes exchange Logo ideas, procedures, and projects. Students not only learn Logo; they learn about people in other places.

To get a free application kit, send a large self-addressed stamped envelope to: The National Logo Exchange, Attn: LCPN 83-84, PO Box 5341, Charlottesville, VA 22905.

You'll receive a full explanation of the network and a questionnaire to help match your class with a penpal according to their grade level, Logo experience, interests, and computer compatability.

LET'S MAKE A DEAL

The students at Deer Creek school in Arcola, Mississippi, are getting into other people's business. And everyone is happy about it! Deer Creek is a small rural school (K-12) that didn't have enough funds to buy computers. So Mary Lucy Sennett approached some small local businesses with an idea called Project CompuShare.

The main objective is for businesses to donate microcomputers to the schools. In return, students do some of the company's computer work for minimum wage. Students take care of business, such as creating and updating files for mailing labels—before and after school, and during lunch.

Thanks to CompuShare, Deer Creek now has enough computers for every student to take computer science at least once a week. Some students even get to check out computers over the weekend. Unless, of course, the teachers sign them out first!

THE VID KID

The sixth graders at Alta-Vista Elementary School in Abilene, Texas, relish the fact that their classmate, Rawson Stovall is a syndicated columnist. They're especially proud because his column, "The Vid Kid," reviews home video games—a subject near and dear to their hearts.

Even the teachers read the 11-year-old student's weekly column. "But they still don't know very much about home video games," Rawson says.

Rawson began reviewing video games a year ago for his hometown paper, The *Abilene Reporter-News*. "My best feedback has been mostly from boys in junior high," Rawson says. "But I've gotten a lot of response from grandmothers, too. Grandmothers don't always know what I'm talking about, but they like to read my column, so one time I included a recipe for Pac-Man cookies."

So far, the blond-haired Dennis the Menace look-alike has convinced 10 newspapers to carry his column.

What does Rawson have planned for the future? "I'd like to design games, be president of a game company, do some public relations or advertising, be a columnist, and that's it."

LONG DISTANCE LEARNING

The next time your telephone rings, it could be your computer class calling. That's what teachers at Romoland Elementary School in Riverside County, California, told their students. The school is the pilot site for a learning system called Dial-a-Drill. The system delivers computer assisted instruction in reading, math, and spelling to students over touch-tone telephones.

When dial-a-drill calls, the telephone becomes a terminal, linking the students to an instructional computer. Students complete lesson exercises by pressing buttons on the touch-tone dial. In turn, they receive immediate feedback. At the end of the six to 10-minute session, the student is given a score. Each week, teachers receive progress reports.

Unfortunately, Dial-a-Drill is not within the budgets of most school districts. The minimum cost is more than $4,000 each year. Contact: Computer Curriculum Corporation, 1070 Arastradero Road, Palo Alto, CA 94304.

KIDS TEACHING KIDS

Did you ever think of using the gifted kids in your class to write drill and practice programs for remedial students? Math teacher Quentin Goodwin thinks it's a great idea. He is the brains behind "Kids Teaching Kids Through Computers," a peer tutoring program at Eaton Middle School in Eaton, Colorado. Goodwin's gifted students write programs that drill remedial students in their specific problem areas.

The project began two years ago with five microcomputers and some enthusiastic kids. Now Eaton has 14 micros and a constantly growing software library (more than 100 programs). But the best part of "Kids Teaching Kids" is that everyone wins! According to a Title I teacher's report, 32 low level students gained an average of 1.8 years overall during the program's first year. And the accelerated students became better problem solvers because they had to thoroughly think through the steps required to write a program, says Goodwin.

Mindy Pantiel, Becky Petersen

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Academic Apple. Written for parents and teachers who are interested in helping youngsters learn with the aid of an Apple computer. R0033-2, paper, $10.95.

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CLOSE ENCOUNTERS WITH THE INSIDE

By Sandra Markle

"Wow! It looks like a tiny city," a student exclaimed, pointing out black tile buildings and green circuit highways. The student was looking at the inside of a computer.

Sandra Markle is the author of several computer books for children including Computer Tutor Junior *(Learning Works) and* Kids' Computer Capers *(to be released in October by Lothrop, Lee, and Shepard).*

It seems kids (and adults) are almost always curious to know what really goes on "inside a computer." Show your kids the cover of this month's *Teaching and Computers* and ask them what they see. (If you have access to an Apple computer, lift off the plastic lid behind the keyboard and show students this sight firsthand.)

Tell children they are looking at the *motherboard* of a computer. Each black rectangular block on the board is a plastic or ceramic "house" that contains a silicon *chip*. Most chips are no bigger than your thumbnail, but they have thousands of message pathways on them. The pathways carry electrical signals that give the computer information. These pathways are called *electrical circuits* because they carry electrical signals in a circle. Signals travel from a chip to the *CPU* (which is a chip itself), back to the chip.

Next, take a look at the inside of an Apple II *(on page 16)* . While the arrangement of the inside may vary from computer to computer, each contains the same basic parts.

In this diagram, the CPU (Central Processing Unit) is the largest rectangular block in the center of the board. Often called the "brain" of the computer, the CPU processes and then transfers all data that enter the computer.

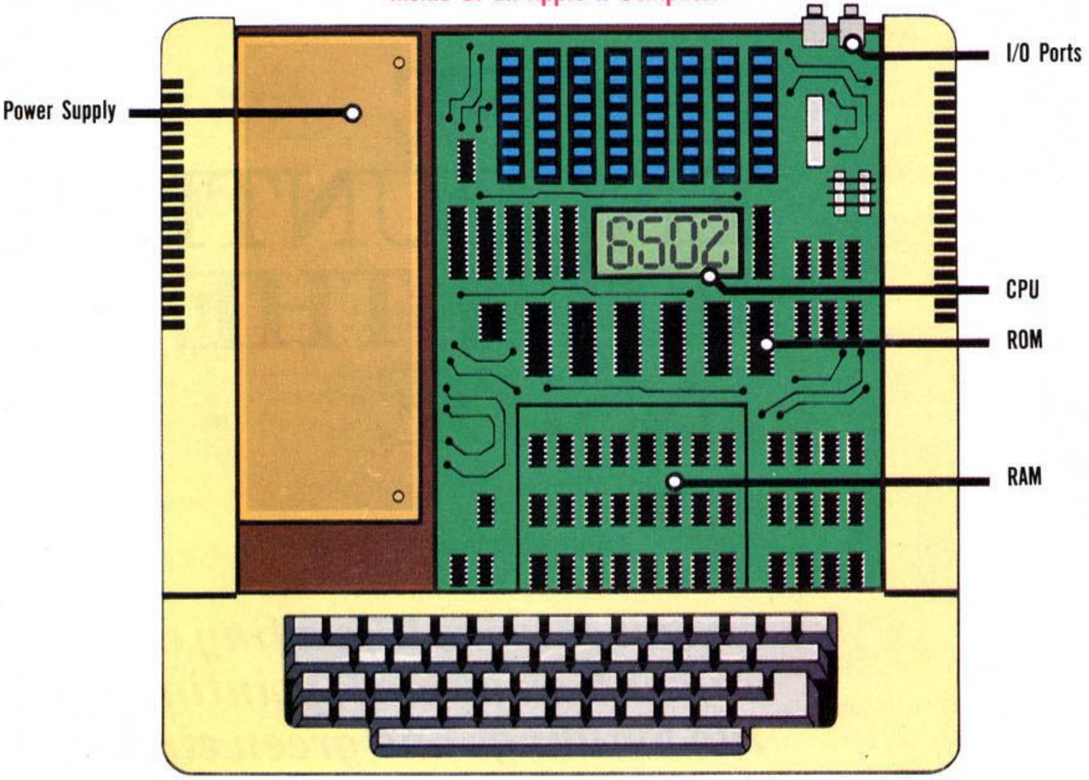
A computer can store information to use later. The part of the computer where information is stored is called a *memory*. A computer has two kinds of memory: *ROM* and *RAM*. Find these in the illustration.

ROM (Read Only Memory) chips store important programs or information that has been entered by the computer manufacturer. A program that translates the computer language BASIC into a language the computer understands (called machine language) is an example of information stored in ROM. The chips cannot be altered or erased. Also, they can only read data—not send out data.

The contents of RAM (Random Access Memory) chips are not permanent and so can be altered or erased. RAM chips store data and instructions entered from the keyboard, a disk drive, a cassette recorder, or other input devices. They can also display, print out, or send out data in other ways. Depending on what program is loaded into RAM, your computer can be a word processor, a video game, or even a calculator. Other chips on the board control such things as video output and the keyboard.

Continued

Inside of an Apple II Computer



In the back of the board are eight slots. Each slot can hold one *interface card*. These cards can expand the computer's capability. An interface card can link your computer to a printer, a disk drive, a telephone modem, or other peripheral.

The large rectangular unit on the far left is the *power supply*. It converts 110 volts from a wall outlet to a regulated 5 or 12 volts needed to power the computer.

In front of the power supply is the *speaker*. It can produce a variety of sounds.

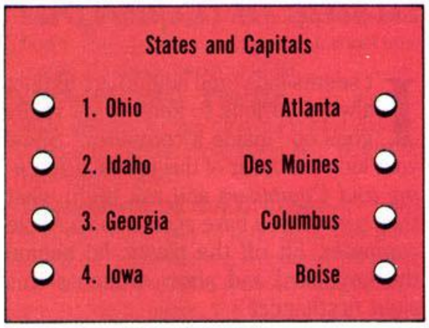
At the back right of the computer are input/output ports (*I/O ports*). These are jacks that link various peripheral devices such as a monitor and cassette recorder to the CPU.

Following are four activities that will help your students investigate the inside of a computer.

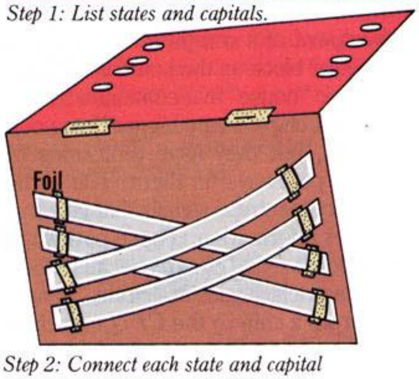
Circuit Game

You can help students understand how electrical circuits work inside a computer with this easy-to-construct circuit game. Follow these steps.

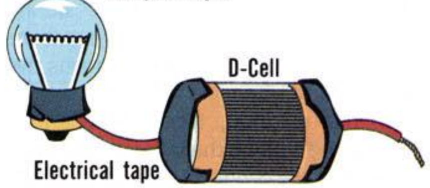
1. On a piece of heavy construction paper, list the 50 states in a vertical column. Make a second column of state capitals. (Be sure to list both states and capitals randomly.) Use a pencil tip to punch an answer hole beside the name of each state and capital.



Step 1: List states and capitals.



Step 2: Connect each state and capital with foil strips.



Step 3: Make a game "tester."

2. Tape another piece of construction paper behind the first. On the inside of the second sheet, put dots that line up with the answer holes on the first sheet. Use these marks to tape a foil strip from the hole next to each state to the hole of its corresponding capital.

3. Now you need to make a "tester." Get two pieces of insulated wire. At the ends of each piece, remove ¾″ of the insulation. Attach the end of one wire to the top of a D-cell battery. Cover with electrical tape. Tape one end of the wire to the bottom of the D-cell battery, then wrap the remaining end of one wire around the metal base of a flashlight bulb.

4. Now play the game! Place the bulb base of the tester in the answer hole next to any state. Then place the end of the tester's free wire in the answer hole of the state's capital. If you matched the state and capital correctly, the bulb will light.

Why does the bulb light up when you match the state and capital correctly? Because you formed a complete electrical circuit. Electrical signals left the battery, traveled through one wire to the foil

Illustrations by Bill Sillbert

strip (which can carry electricity), to the other wire, back to the battery—making a full circle or complete circuit.

If you match a state and capital incorrectly, the bulb will not light because there won't be an aluminum strip joining both wires (no complete circle).

Chip Crew Relay

Have students simulate the systematic way messages are carried in an electrical circuit with this relay game. Divide your class into two "chip crews." Tell each crew to form a single line in the back of the room. Select a child in the middle of each row to be the CPU. Give each CPU a felt-tipped pen.

In the front of the room, equidistant from each crew, have a student (the monitor) face each of the chip crews.

On your mark, get set—hand a flash card showing a computer math problem like PRINT 5 + 7 to the first crew member in each row. Just as an electrical pathway carries signals, kids are to pass the information card, one by one, to the CPU. The CPU turns the card over and writes the answer (12). The CPU passes the solved problem to crew members behind him or her. When the last crew member receives the answer, he or she runs to the team's monitor in the front of the room; the monitor displays the answer. The fastest crew scores one point —if the answer is correct. Each time a math problem is processed, rotate crew positions.

When play is over, ask: "Is anyone tired? Does anyone think this would be a boring job to do for a whole day?" Point out that computers can do similar jobs over and over without getting tired or bored. They also can do the job very quickly! If possible, use the computer to show students how quickly it can solve a math problem.

Translate a Binary Code

When you press keys on a keyboard, the inside of the computer does not see something like the letter "a" or "b." Instead it has an electronic code for each letter of the alphabet, punctuation mark, numeral, and so on.

Called the *binary code*, it uses two symbols 0 (zero) and 1 (one) to represent all data. One of these symbols, 0 or 1, is called a *binary digit* or *bit*. Several bits organized in a particular order represent a single letter, number, or punctuation mark.

There are several binary codes. The most common is *ASCII* (American Standard Code for Information Interchange).

Here is a copy of its alphabet.

A	0100 0001	N	0100 1110
B	0100 0010	O	0100 1111
C	0100 0011	P	0101 0000
D	0100 0100	Q	0101 0001
E	0100 0101	R	0101 0010
F	0100 0110	S	0101 0011
G	0100 0111	T	0101 0100
H	0100 1000	U	0101 0101
I	0100 1001	V	0101 0110
J	0100 1010	W	0101 0111
K	0100 1011	X	0101 1000
L	0100 1100	Y	0101 1001
M	0100 1101	Z	0101 1010

Post the alphabet so your students can decode the riddle answers that follow.

1. Where do Eskimos keep their money? (SNOWBANKS)
0101 0011 0100 1110 0100 1111 0101 0111 0100 0010 0100 0001 0100 1110 0100 1011 0101 0011
2. Which monster eats fastest? (GOBLIN)
0100 0111 0100 1111 0100 0010 0100 1100 0100 1001 0100 1110
3. What is the saddest piece of clothing? (BLUE JEANS)
0100 0010 0100 1100 0101 0101 0100 0101 0100 1010 0100 0101 0100 0001 0100 1110 0101 0011

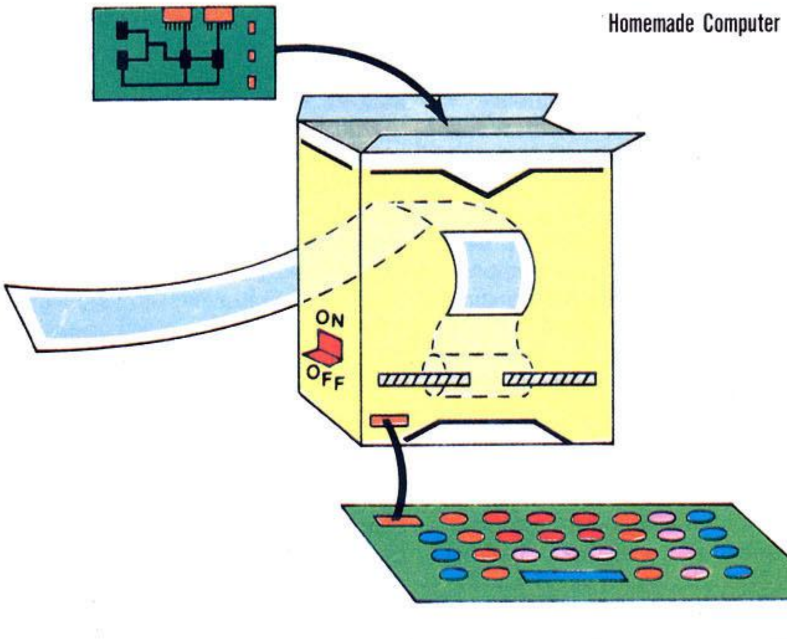
Tell kids that each bit acts like a tiny light switch. When the bit is represented by a 1, an electrical impulse is emitted. When the bit is represented by a 0, no electricity is emitted. A combination of 1s and 0s forms an electrical signal that stands for a letter, number, and so on. The electrical signals are carried through the electrical circuits we examined in the first two activities.

Build Your Own Computer

The best way to understand how all the parts of a computer work together is to build a model computer.

1. Get a large laundry detergent box. In the front of the box, cut two slits, one on top of the other, about 6" apart. (See illustration). Cut another slit in the center of the box back.
2. Put a roll of adding machine tape inside the box and thread the tape through the front slits, then through the back slit. This forms a video screen in front and a printout in back.
3. Make a cardboard keyboard and place it in front of the box.
4. Below the video screen, cut two slots to form disk drives. Cut two cardboard disks and put them inside the slots.
5. Draw chips and circuits (complete with CPU, ROM, and RAM) on a piece of paper. Put it inside the box.
6. Add a paper on-off switch and two yarn electric cords: one to connect the keyboard and CPU to the monitor, another to plug the computer into a power outlet.

Students can practice booting (turning it on), loading disks, and typing commands. After typing, have students print the command on the model's video screen as it would be displayed, press ENTER, and print the correct response below the command. Pulling the tape through clears the screen and provides another form of output—a printout. ☐



Homemade Computer

EVERY TEACHER IS A COMPUTER INSTRUCTOR; EVERY STUDENT IS A PROGRAMMER.

by Shiela Swett

That's the philosophy at Evans School in Yeadon, Pennsylvania, where both teachers and students use a computer language called PILOT.

PILOT POINTERS

A LARGE BANNER IN THE FRONT hall says "Evans Computer Magnet School," but no one needs to be told that this K-6 school in Yeadon, Pennsylvania, is interested in computers. The evidence is everywhere.

Bulletin boards in the entrance way display photographs of students working with computers. The classroom corridors are filled with wall after wall of children's flowcharts, printouts, and stories about computers. Each homeroom has computer information posted alongside its alphabet charts, animal posters, and other classroom hang-ups. And the computer lab—a large, cheery classroom where each teacher takes his or her class according to schedule—is pulsing with activity.

The lab is truly the heart of the school. There are 15 Atari 800 computers—two students working on each.

Just now a teacher, who has been moving about the room—checking work and helping students with problems—stops to examine a science quiz that Jay Campbel has programmed for his partner. (See box: *How PILOT Works.*)

Jay is a fourth grader at Evans, who, like all Evans students, has learned to write simple programs using a computer language called PILOT. He was taught PILOT by his classroom teacher, Doreen Carson, who, like all Evans teachers, incorporates computers into her everyday teaching.

Whether students are studying the state of Idaho, nouns and pronouns, or the difference between a square and a rectangle, they use computers as a learning tool at Evans.

Remarkably, just one year earlier none of the teachers had ever laid hands on a computer. All that changed in the spring of 1982 when the school's new principal, Thomas Kerr, was looking for a way to strengthen the overall academic program and to encourage students from all racial and economic backgrounds to enroll in his suburban Philadelphia school. He outlined a program called C.A.M.E. (Computer Awareness Magnet at Evans) in which computers would be used in all areas of the curriculum. At the start of the program, Kerr made two highly unconventional decisions: one was not to purchase any prepackaged software programs and the other was not to hire a computer specialist.

"I wanted our 400 students to be in control of this new technology," Kerr explained. "Having children merely run prepackaged software was not the answer." Instead, he decided kids would learn how to write their own programs.

As for the decision not to hire a computer specialist, Kerr believed that

---

Shiela Swett is a computer consultant at Rippowam-Cisqua School in Bedford, NY.

TAKE
BYTE
MY
FRIEN
12

Photographs by Elizabeth Richter

children's computer work must be directly related to their classroom work. The best way to do that, he determined, was to have the classroom teacher administer both.

The first step in initiating C.A.M.E. was to select a computer language that both teachers and students could use to write programs. Kerr thought that BASIC was too complicated for primary kids. Logo, he decided, seemed too connected with math and graphic designs, and not flexible enough to be used easily in social studies, language arts, and other verbally oriented subjects.

Then there was PILOT to consider. PILOT is a language used to create drill and practice programs. It also has graphics capabilities, editing features, color, and sound. Though it's considered a language for teachers, Kerr thought PILOT might work with kids, too. The few commands are single key strokes and the language is easy to remember. It's also easy to combine both text and graphics on the screen at once, so a first grader could illustrate a story and a fourth grader might draw a science diagram and label it. It was decided. PILOT would become the universal language at Evans school!

PILOT is available for most major computers. Because Atari's computer prices seemed the most reasonable, Kerr decided to buy Atari 800 computers and the Atari version of PILOT.

CRASH COURSE IN COMPUTING

The program's philosophy was set, the computer language and model were selected, but the major challenge still lay ahead: how could the teachers, in just six months, learn enough about computers to use them in their everyday curriculum? The following six-month schedule of events outlines the steps that were taken.

March The plans for a computer magnet school, a school that could enroll any elementary student in the William Penn school district who wanted to learn with computers, was accepted.

April The current faculty members reviewed the plan and were given the choice of joining the effort or changing schools. Only two teachers opted out. They were quickly replaced by two enthusiasts.

May A computer awareness workshop was conducted.

June A committee of teachers was formed to organize material for two manuals: (1) a literacy manual that contained ways to teach computer literacy at each grade level, without a computer, and (2) a skills guide to teach programming in PILOT, at a computer. This included ways to apply PILOT in science, social studies, language arts, and math—at every grade level in the school.

July The completed manuals went to the printer.

August The computers arrived at school. The faculty was paid to go into the school for one week of hard work. During the first two days, teachers set up a computer lab. For the remaining three days, they practiced operating the computers and learning PILOT. A "we can do it" attitude prevailed throughout the week. Kerr offered constant encouragement, reminding them, "You don't have to be a PhD historian to teach history, so why should teaching programming require computer scientists?"

Continued

September After school started, the district gave Evans teachers five inservice half-days to practice on the computer and to set up computer schedules.

October The computer program began. "Sure, we weren't pros," said one teacher, "but we felt we could do it."

PILOT ACTIVITIES

And the teachers *did* do it. Using PILOT, they incorporated a variety of computer learning in their classrooms. Here's a sampling.

PILOT Primers As an introduction to PILOT, students were asked to write short four-or five-sentence paragraphs on topics of their choice. Here are two PILOT programs written by Margie Cafarchio, a first grader:

```
10 T: A COMPUTER IS A MACHINE.
20 T: IT WORKS MATH PROBLEMS.
30 T: COMPUTERS WORK VERY FAST.
40 T: THEY SAVE TIME.
```

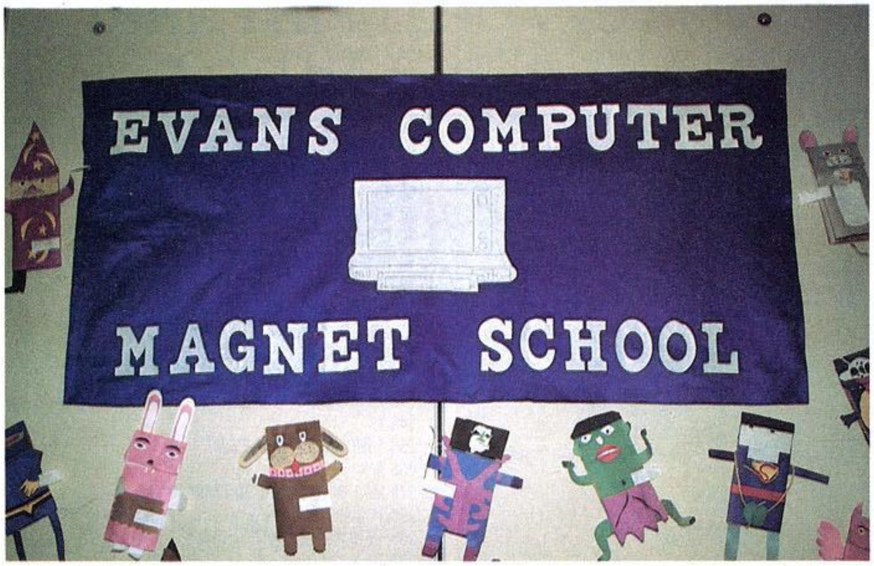
```
10 T: FLOWERS HAVE FOUR PARTS.
20 T: THEY HAVE ROOTS.
30 T: THEY HAVE A STEM.
40 T: THEY HAVE LEAVES.
50 T: THEY HAVE PETALS.
```

Margie could have written these paragraphs with paper and pencil, but an exercise on plain paper with messy erasures and scratch-outs would not have given her as much pride as a run or printout of these little programs. Then, too, she may not have expressed her ideas so sequentially.

Grammar Exchange Instead of passively completing a worksheet on nouns and pronouns, fourth graders wrote their own programs called "Replacing Nouns with Pronouns." The programs consisted of "noun-packed" stories in which students were to go back and replace the nouns with appropriate pronouns. Children delighted in swapping programs and making pronoun replacements.

Make-a-quiz Research projects in science and social studies were assigned with a new twist: use your information to write a computer quiz. Ants, snails, astronomy, lungs, and New York City

Two students per computer (above and below) gives everyone a chance to have fun!



The walls at Evans are filled with computer projects.

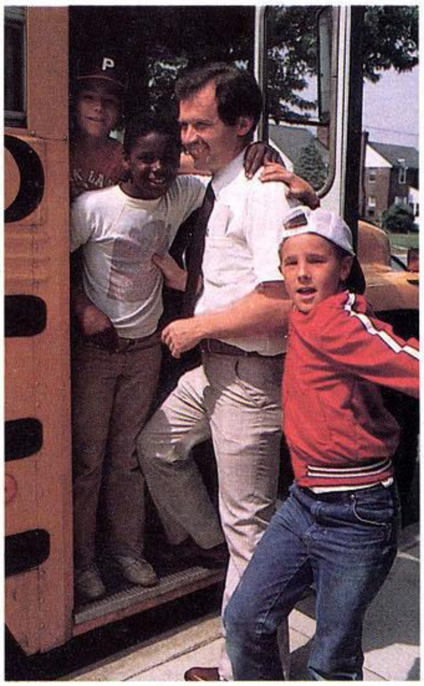
became the subjects for such quizzes. Sixth grader Matthew Trip wrote a lengthy and sophisticated quiz on dinosaurs, which offered a choice of basic or advanced questions, and included sound effects!

Peer Tutoring One fourth grade teacher joined forces with a kindergarten teacher to organize a happy partnership in which the five-year-olds sat on the laps of their fourth grade "buddies" and played simple letter and number games created by the "older kids."

Geometric Puzzlers A sixth grade math teacher found his students ready to learn the graphic capabilities of PILOT just as he was beginning a unit on geometry. A project that kept his students buzzing with activity was to have them create a square, a rectangle, a right triangle, and an equilateral triangle, each in a specific quadrant of the screen, each filled in with a solid color. After several class discussions on geometry, plus making geometric samples on graph paper, students learned how to use PILOT to transfer geometric sketches onto their monitors. The variety of solutions presented still another learning experience.

Hand-Eye Game Barbara Carr, a special education teacher for six- and seven-year-olds, developed a simple game in which kids move the cursor from the upper left-hand corner to the lower right-hand corner of the computer screen. The first to do so wins. Students must keep watching the cursor as it moves across the screen from left to right, top to bottom, while pressing the space bar. The result? Greatly improved tracking skills!

Rhythm Exercises Carr had a number of disrhythmic children whose oral reading became smoother after playing a computer game in which they typed letters at a steady pace, in response to her dictating them at a controlled rate.



Evans Principal Tom Kerr and computer students.

HOW DO TEACHERS EVALUATE THEIR FIRST YEAR?

There is no hard data yet; no pretest, post-test to prove that the computer has made a significant growth in achievement, but often teachers can instinctively measure progress, and according to the instincts of Evans teachers, the computer has been responsible for big gains.

"I've been teaching for seven years, so I know that it was not my teaching alone that made the year's achievement so much higher," Barbara Carr said. "I'm convinced it is the use of the computer that brought about the great improvement."

Doreen Carson stresses the development of logical and analytical thinking skills in her teaching. The past year she noticed a "very real growth" in her students' abilities to deal with causal and conditional relationships.

"Students also paid more attention to mechanical details in their writing, such as spelling and punctuation. I think that was because computer editing in PILOT is almost a game," Carson said.

WHAT NEXT?

Kerr has scheduled additional teacher inservice time to explore other PILOT possibilities. And the two teaching manuals are already being revamped by staff members. Also on the agenda is, (1) exploring various management systems for teachers, (2) linking up with a local college to design a research study of the computer's effectiveness at Evans, and (3) sharing Evans' experience with other schools, and trying to find others using PILOT such as the Fairfax County schools in Fairfax, Virginia, and the Capital Children's Museum in Washington, D.C.

"It's been scary being a computer pioneer. We've often felt isolated, working without a model, learning as we go along," Kerr said. "But it's the process of learning about computers that we were really after," Kerr adds, ". . . the process of feeling comfortable and in control of this new technology, and I think we've achieved that."

Any school whose entire faculty can integrate computer instruction into their teaching, and whose entire student body can program, has indeed achieved control of the computer. ☐

Circle 2 on Reader Service Card.

WHAT IS IN A NAME?

The name . . .
JEAN RICE is synonomous with Computer Literacy to thousands of teachers and elementary students.

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• HOW PILOT WORKS •

Sample Pilot Program

```
5 R:SCIENCE
10 R:SCIENCE
20 R:THE HEART
30 T:                    HEART
40 T:
50 T:NAME THE MOST IMPORTANT PART
 . IN YOUR CIRCULATORY SYSTEM?
60 A:
70 M:HEART
80 TY:RIGHT!!!!!
90 TN:WRONG!!!!!
100 T:
110 T:WHAT DOES THE HEART DO?
115 A:
120 M:PUMPS BLOOD, BEATS
130 TY:VERY GOOD! MARVY!!!!!!!!
140 TN:WRONG!
145 T:
150 T:WHY DO WE NEED BLOOD?
155 A:
170 M:TO MOVE OXYGEN, TO CARRY OXYGEN
180 TY:RIGHT!!!!!!!!
190 TN:WRONG AGAIN!
191 T:
200 T:WHICH TUBES MOVE BLOOD OUT OF THE HEART?
205 A:
210 M:VEINS
220 TY:THAT'S CORRECT!!!!!
230 TN:YOU WERE WRONG. IT'S THE VEINS!
235 T:
240 T:
250 T:WHAT TUBES TAKE BLOOD INTO THE HEART?/
260 A:
270 M:ARTERIES
280 TY:MARVY!!!!!!
290 TN:WRONG AGAIN!!!!!!!
300 T:BY JAY CAMPBEL
305 T:
310 E:
```

PILOT stands for Programmed Instruction Learning or Teaching. It is a simple programming language developed specifically for creating computerized lessons. There are commands to display information, questions and feedback; to accept a student's responses; and to check whether a response matches any items in a list provided by the teacher.

Above is a simple PILOT program written by fourth grader Jay Campbel. Jay used his research on the heart to create a science quiz.

He used the T:(TYPE) command to tell the computer to print information on the screen. The A:(ACCEPT) command tells the machine to wait for a student to enter a response.

The M:(MATCH) command checks whether the student's answer matches any one of a list of answers provided by Jay. For example, the match list for the question, "What does the heart do?" is "Pumps blood, beats." The computer scans the response to the question for one of these answers.

The commands Y: and N: stand for YES and NO, and refer to whether the last M: command found a match. Combining Y: or N: with another command makes the command conditional. For example, TY: tells the computer "If a match is made, then TYPE:___" TN: tells the computer "If a match is not made, then TYPE:___" E: means to end the program.

WHAT'S YOUR COMPUTER IQ?

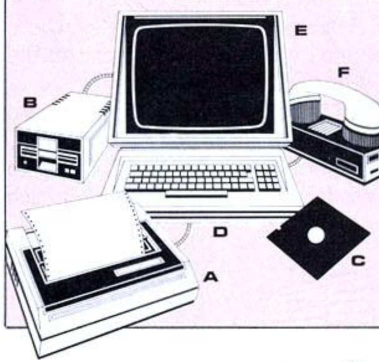
TAKE THIS TEST AND SEE WHERE YOU RANK ON THE COMPUTER LITERACY SCALE.

WHAT IS COMPUTER Literacy? It's more than just knowing an Apple from an Atari. But it doesn't have to mean knowing how to program a rocket to land on the moon, either. Most computer literates fall somewhere in between.

In general, a person who is computer literate has an understanding of computers in five major areas: Computer Components, Software, Terminology, Computers in Society (Past, Present, and Future), and Introductory Programming.

How would you rate your knowledge in these areas? To help you find out, assistant editor Lorraine Hopping put together this fun but instructional quiz on computer literacy. Questions are based on guidelines from the Utah, Tennessee, and District of Columbia departments of education. Special thanks to the T&C advisers for their input.

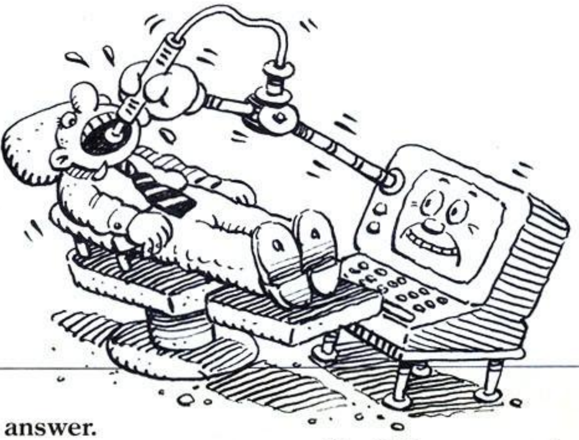
Part 1
COMPUTER COMPONENTS



Match the words with the pictures.

__1. Disk drive
__2. Keyboard/CPU
__3. Monitor/CRT
__4. Printer
__5. Modem
__6. Floppy disks

Bonus Question: What are the two primary components in a CPU?



Part 2
SOFTWARE

Circle the best answer.

1. Computer Managed Instruction (CMI) programs
   a. Keep track of student attendance and tardiness.
   b. Teach students how to operate the computer.
   c. Track student's progress and keep records on student performance.

2. Drill and practice programs are
   a. Sets of exercises that give students practice in a particular skill.
   b. Structured lessons that teach math.
   c. Most useful to budding dentists.

3. Simulation programs "simulate"
   a. The inner workings of computers and are only used in advanced computer science classes.
   b. Just about anything—from tossing a coin to flying a space shuttle.
   c. The DNA structures in genes and may some day be used to produce clones.

4. Tutorial programs are
   a. Electronic flash cards that generate random problems.
   b. Computer-generated lessons that reinforce individual student learning.
   c. Centers where students volunteer time to help other students.

5. Word processing, database management, and electronic spreadsheets are programs that would most likely appear
   a. On a space shuttle.
   b. In a classroom.
   c. In an office.

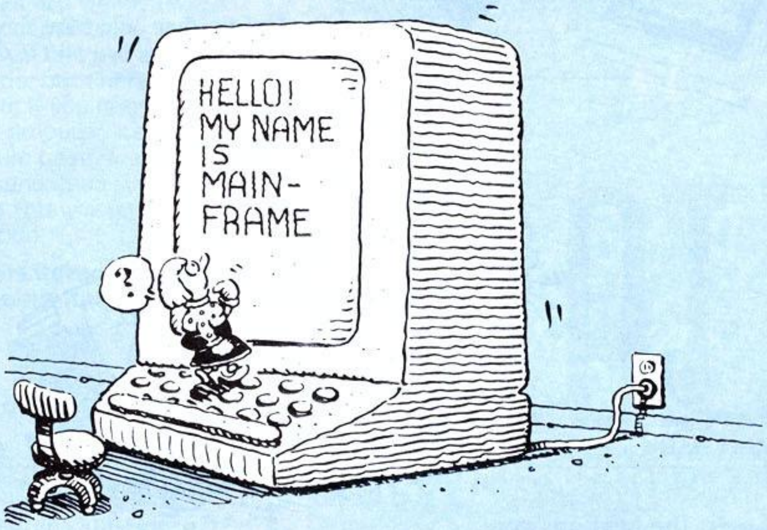
Bonus Question: Software that allows the computer to play chess simulates human thinking. What is the term for this ability?

Continued

Part 3
TERMINOLOGY

Circle the best answer.

1. The binary code
   a. Uses ones and zeroes to represent data.
   b. Helped the allies unscramble coded messages from the Germans during World War II.
   c. Consists of two sets of instructions, one for setting up computers and the other for operating them.
2. A programming error is called a
   a. Chip.
   b. Bug.
   c. Bad TV Show.
3. CAI is an acronym for
   a. Calculated Additional Input.
   b. Computer Automated Interface.
   c. Computer Assisted Instruction.
4. A cursor is best described as
   a. A blinking light that indicates where the next character will appear on the screen.
   b. An indicator light on the keyboard that tells you if the power is on or off.
   c. A person who keeps forgetting to press RETURN or ENTER after each program line.


HELLO! MY NAME IS MAIN-FRAME
?

5. Information printed on paper (as opposed to information on a computer screen) is called
   a. Data.
   b. Hard Copy.
   c. Processed Information (P.I.).
6. RAM (Random Access Memory)
   a. Is permanent and retains information indefinitely.
   b. Can be used over and over by multiple users.
   c. Never forgets a ewe.
7. Mainframe computers
   a. Are computers that are entirely self-contained in one unit.
   b. Consist only of a terminal, which is hooked to other mainframe terminals.
   c. Are larger and more powerful computers.
8. Input units refer to
   a. Those devices through which information is entered into a computer.
   b. The number of digits or characters contained in the memory.
   c. Items of information entered into a computer and stored in the memory.

Bonus Question: A computer designed to input, output, store, and organize characters (letters, numbers, and so on) is called a ________________ computer.

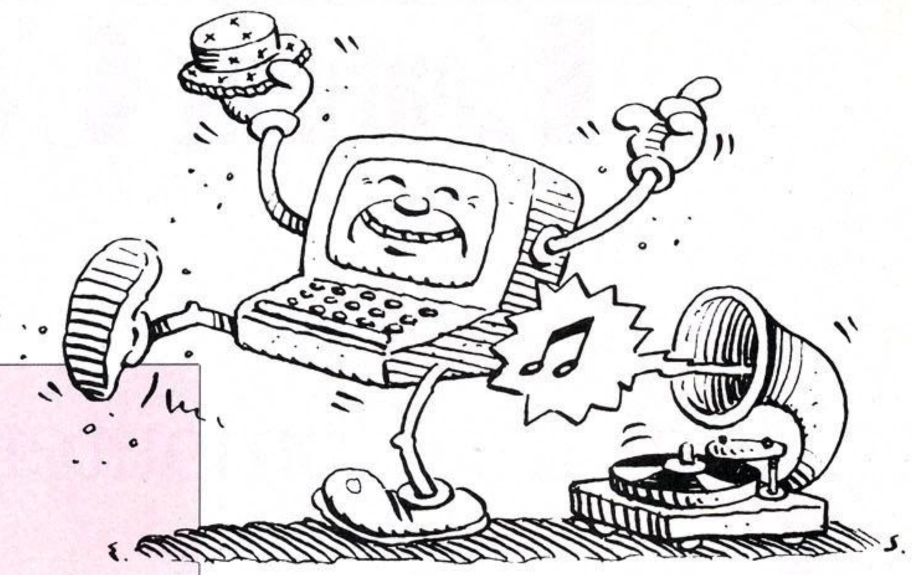
Part 4
COMPUTERS IN SOCIETY: PAST PRESENT AND FUTURE

Circle the ones that are true.

1. In 3000 B.C., the Chinese invented the abacus to facilitate adding and subtracting.
2. Blaise Pascal is often considered the father of computing because of his invention called The Analytical Engine.
3. Second generation computers differed from first generation computers like UNIVAC because they used transistors instead of vacuum tubes.
4. A researcher using an information retrieval service can call up the answer to any question instantly.
5. The biggest general use of computers is for word processing.
6. The best educational use of computers is for individualized drill and practice in mathematics.
7. Computers in schools affect both what is taught and how it is taught.
8. In the next decade or two, home computers will be so common that nearly everyone will use them to shop, bank, vote, and respond to surveys.
9. Computers are out to get us.

Bonus Question: What is the name for the science of computer/human relationships?

Illustrations by Elwood H. Smith



Part 5
PROGRAMMING LANGUAGES

Fill in the blank.

1. ____________ is an authoring language often used by teachers for writing courseware.
2. An easy-to-understand language most common on microcomputers is ____________.
3. ____________ is an interactive language known for its discovery learning approach.

Directions: Determine the outcome of the following BASIC programs.

4.
```
10 PRINT "HELP!" I'M STUCK INSIDE A COMPUTER!"
20 GOTO 10
30 END
```

5.
```
10 PRINT "DO YOU LIKE PEANUTS?"
20 INPUT P$
30 IF P$ = "YES" THEN END
40 PRINT "HOW ABOUT CASHEWS?"
50 END
```

6.
```
10 FOR P = 1 to 10
20 PRINT P
30 NEXT P
40 END
```

7.
```
10 READ D
20 IF D = 99 THEN END
30 PRINT "MY COMPUTER IQ = "; D
40 DATA 210, 99
50 END
```

8. 10 PRINT $((3+3)/(3*4))+3^2$
   20 END

Bonus Question: Do computers know how to dance?

Answer key:

PART 1: Computer Components
1. B 2. D 3. E 4. A 5. F 6. C
Bonus: The Arithmetic/Logic and Control Units.

PART 2: Software
1. c 2. a 3. b 4. b 5. c
Bonus: Artificial Intelligence.

PART 3: Terminology
1. a 2. b 3. c 4. a
5. b 6. b 7. c 8. a
Bonus: Digital or general purpose computer.

PART 4: Computers in Society
1. T 2. F 3. T 4. F
5. F (Data Processing)
6. F 7. T 8. T 9. F
Bonus: Cybernetics.

PART 5: Programming
1. PILOT
2. BASIC
3. Logo
4. HELP! I'M STUCK INSIDE A COMPUTER!
   HELP! I'M STUCK INSIDE A COMPUTER!
   HELP! (etc., etc.)
5. DO YOU LIKE PEANUTS/ YES.
   (or) DO YOU LIKE PEANUTS? NO. HOW ABOUT CASHEWS?
6. The computer will count to 10.
7. MY COMPUTER IQ = 210
8. 9.5

Bonus: Sure! They algorithm!

Scoring
Each regular question is worth five points. Bonus questions are worth 10 points. Grand total: 215 points.
180-215: Computer genius!
140-179: Your circuits are hot!
100-139: Your circuits are lukewarm!
Less then 100: Insufficient data, need more input!

Learning Center

Meet the Computer

LEARNING CENTER is a monthly column for teachers who have an extra special corner in their room—a corner with a microcomputer!

Each month in this column we'll discuss a programming topic, like writing one-liners, debugging programs, or performing slick computer tricks. (All will use the computer language BASIC.) We'll give you background information on each topic along with a group lesson and four student task cards that you can laminate and place in your computer center.

If you don't have a computer in your classroom, but your school has a computer lab, this column is for you, too! You'll find that all of the activities can be adapted easily for use in your lab.

You can't teach programming until kids are familiar with a computer—especially with its keyboard. For that reason, in September's lesson we'll introduce kids to the computer, and in particular, to its keyboard.

A LESSON FOR FIRST-TIME COMPUTING

What is a Computer? Tell students a computer is a machine that stores information in *memory.* It can use this information to solve a problem and display the answer. For example, a computer can find the sum of 2 + 7. People can do the same thing. But they can't do everything a computer can do.

- Write the following list on the board.

  Computers Can:

1. Solve problems with words and numbers.
2. Never make careless mistakes.
3. Never get angry.
4. Alphabetize 1000 words in a second.
5. Do 500 million additions in a second.
6. Get overheated and break down.
7. Store information in a memory.

Ask kids to pick out the things a person cannot do (2, 3, 4, 5).

- Write the following list on the board.

  People Can:

1. Think for themselves.
2. Feel angry sometimes.
3. Laugh at a funny joke.
4. Think up good ideas.
5. Do arithmetic.

Tell children that there are many things people can do that computers cannot. Have them pick the things a computer cannot do from the list above (1-4).

What does a computer look like? At this point, keep the explanation simple. Point out these features on your computer or on this month's pull-out poster.

1. Keyboard—The part of the computer that looks like a typewriter and is used to type in information.
2. Monitor—The TV-like screen that shows information. (Often a computer monitor is a real TV.)
3. Disk Drive or Cassette Player—Small machine that can give information to the computer or store information for the computer.

Meet the Keyboard: Tell students the keyboard is like a typewriter. We type instructions on it; that's how we "talk" to the computer. Display a large poster board replica of your computer keyboard and point out the letter keys, number keys, punctuation keys, and special feature keys.

Show kids how to turn the machine on and off. If you use an Apple or a TRS 80, put the computer in BASIC. Apple users must also type in HOME and press RETURN. TRS 80 users must press the CLEAR key. Now kids are ready for the typing task card!

HOW TO USE THE ACTIVITY CARDS

Usually "Learning Center" will give you four task cards to cut out, laminate, and file in your center. This month, however, one task card is presented for four different machines: TRS 80 Model III, Apple II Plus, PET, and Atari 800. That's because initial keyboard instruction can differ a great deal. Find the card that goes with your machine and place it in your center. (If your computer is not one of these four, on an index card, adapt the exercises to your model.)

This month's card teaches students how to locate the letter, number, and punctuation keys; how to operate the space bar and shift key; and how to erase individual characters or clear the entire screen.

Continued

MEET THE TRS-80 MODEL III KEYBOARD

Look at the part of the computer that looks like a typewriter. This is called the **keyboard**. It is made up of keys that have letters, numbers, or symbols on them. There are also special keys. The key with the word ENTER on it is a special key.

1. Do you see the flashing square in the top left corner? That box is called a **cursor**. It shows where the letter you type will appear on the screen.
2. Type the letters of the alphabet in order.
3. To erase letters, press the ← key. Erase the ABCs.
4. When you want to put a space between two letters, press the space bar. The space bar is the long bar at the bottom.

Type:
THE SMARTEST INSECT IN THE WORLD IS THE SPELLING BEE.

5. Press the CLEAR key. Now your screen is empty.
6. Some keys have one symbol on top and another on the bottom, like this key: $\boxed{\substack{\$\\4}}$. Press the 4 key. You get 4.
7. Find the SHIFT key. It is located at the bottom left and right of the keyboard.
8. Press the SHIFT key. Do not lift up. Press the 4 key also. Lift up on both keys. The monitor shows a $. Holding down the shift key while typing tells the computer to type whatever is on the top half of the key.
9. Type these symbols: " % * ? + =
10. Type these numbers: 4 8 3 2 9 7
11. Press the CLEAR key.
12. Type this sentence:

DID YOU KNOW MOST PENCILS CAN DRAW 35 MILES BEFORE THEY RUN OUT OF LEAD?

13. Notice that when letters fill a line, the computer starts a new line.

MEET THE APPLE II PLUS KEYBOARD

Look at the part of the computer that looks like a typewriter. This is called the **keyboard**. It is made up of keys that have letters, numbers, and symbols on them. There are also some special keys. The key with the word RETURN on it is a special key.

1.. Do you see the flashing square in the top left corner? That's called a **cursor**. It shows where the letters you type will appear on the screen.

2. Type the letters of the alphabet in order.

3. If you make a mistake, press the key with an arrow pointing left on it: $\boxed{\leftarrow}$

Keep pressing it until you reach the mistake. Type in the correct letter over your mistake.

5. When you want to put a space between two letters, press the space bar. The space bar is the long bar at the bottom. Keep pressing the space bar until you reach a new line.

6. Type: THE SPELLING BEE IS THE SMARTEST INSECT IN THE WORLD.

7. Notice that when letters fill a line, the computer will start a new line.

8. Some keys have one symbol on top and another on the bottom, like this key: $\boxed{\substack{\$\\4}}$. Press the 4 key. You get 4.

9. Find the SHIFT key. It is located at the bottom left and right of the keyboard.

10. Press the SHIFT key. Do not lift up. Press the 4 key also. Lift up on both keys. The screen shows a $. Holding down the shift key while typing tells the computer to type whatever is on the top half of the key.

11. Keep pressing the space bar until you reach a new line.

Type these symbols: " % * ? + =

12. Type these symbols: 4 8 3 2 9 7

CHALLENGE:

1. *Type today's date.*
2. *Type your age.*
3. *Type your favorite joke.*

MEET THE ATARI 800 KEYBOARD

1. Turn on the computer and video screen. Do you see the small box right below the word READY? That's called a **cursor**. It shows where the letters you type will appear on the screen.

2. Type the letters of the alphabet in order.

3. To erase letters, press DELETE BACK S . It is located at the top right of the keyboard. Erase the ABCs.

4. When you want to put a space between two letters, press the space bar. The space bar is the long bar at the bottom.

Type: THE SMARTEST INSECT IN THE WORLD IS A SPELLING BEE.

5. Notice that when letters fill a line, the computer starts a new line.

6. Find the shift key. It is located at the bottom left and bottom right of the keyboard. Find the CLEAR key. It is two keys to the left of the DELETE key.

7. Press the SHIFT key. Do not lift up. Press the CLEAR key at the same time. Now your screen is empty.

8. Some keys have one symbol on top and another on the bottom, like this key: $ 4 . Press the 4 key. You get 4.

9. Find the SHIFT key again. Hold it down. Press the 4 key also. Lift up on both keys. The screen shows a $. Holding down the shift key while typing tells the computer to type whatever is on the top half of the key.

10. Type these symbols: ! ” % * ? + =

11. Type these numbers: 1 4 8 3 2 9 7

12. Hold down the SHIFT key and press the CLEAR key.

CHALLENGE:

1. *Type today's date.*
2. *Type your age.*
3. *Type your favorite joke.*

MEET THE PET KEYBOARD

Look at the part of the computer that looks like a typewriter. This is called the **keyboard**. It is made up of keys that have letters, numbers, or symbols on them.

1. Turn on the computer. Do you see the flashing square in the top left corner of the screen? That's called a **cursor**. It shows where the letters you type will appear on the screen.

2. Type the letters of the alphabet in order.

3. To erase letters, press INST DEL . It is located at the top right of the keyboard. Erase the ABCs.

4. When you want to put a space between two letters, press the space bar. The space bar is the long bar at the bottom.

Type:
THE SMARTEST INSECT IN THE WORLD IS THE SPELLING BEE.

5. Notice that when letters fill a line, the computer will start a new line.

6. Find the SHIFT key. It is located at the bottom left and right of the keyboard. Locate the CLR HOME key. It is located at the top right of the keyboard.

7. Press the SHIFT key. Do not lift up. Press the CLR key at the same time. Screen is empty.

8. Some keys have letters on top and symbols on the front. Press the S key. You get an S.

9. Find the SHIFT key again. Hold the SHIFT key down. Press the S key also. Lift up on both keys. The screen shows a heart. Holding down the shift key while typing tells the computer to type one of the symbols on the front of the key.

10. Type these letters and numbers:
A N U P 5 3 8

11. Type these symbols:
* = + (heart) (club) (square)

12. Hold down the SHIFT key. Press CLR key.

13. Type this sentence: DID YOU KNOW THAT MOST PENCILS CAN DRAW 35 MILES BEFORE THEY RUN OUT OF LEAD?

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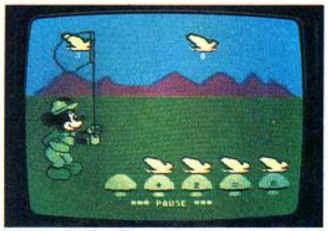

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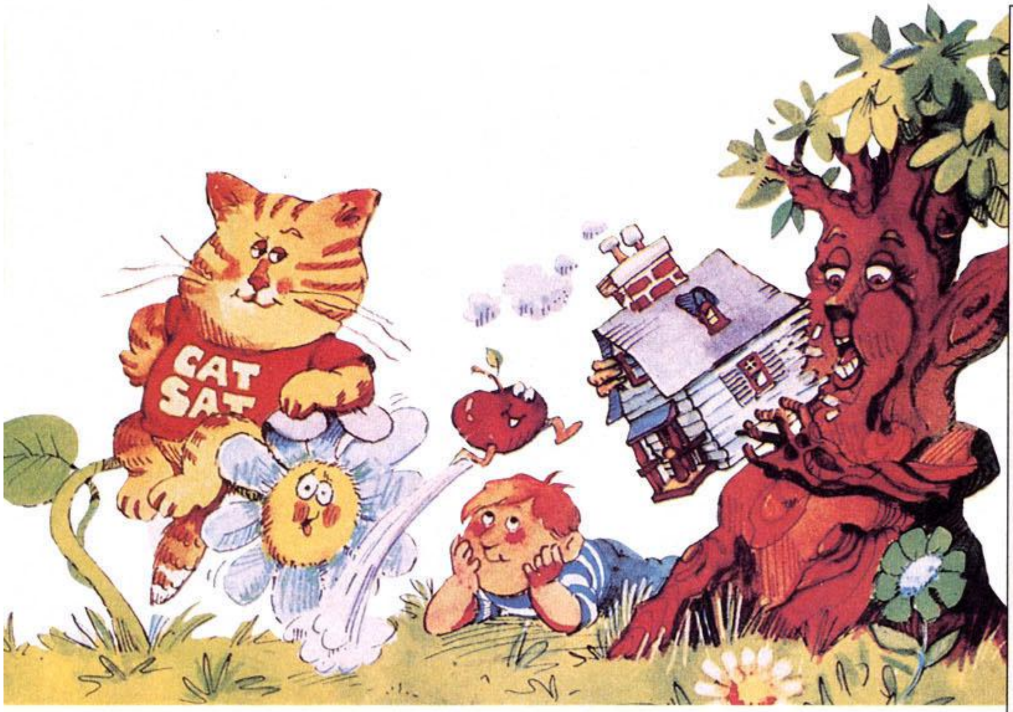
CIRCLE 17 ON READER SERVICE CARD



THE STORY MACHINE DICTIONARY

Articles
The
An
A

Adjectives
This
That
These
Those
Some

Pronouns
He
She
It
They

Nouns
Apple(s)
Box(es)
Boy(s)
Bumpus(es)
Cat(s)
Dog(s)
Fence(s)
Flower(s)
Girl(s)
Rock(s)
Store(s)
Tree(s)
House(s)

Possessive Pronouns
His
Her
Its
Their

Prepositions
At
By
To
For
In

Verbs
Are
Dance(s)
Eat(s)
Go(es)
Hop(s)
Is
Jump(s)
Run(s)
Sing(s)
Walk(s)
Zot(s)

The *Story Machine* Dictionary. Stories are limited to these sight words.

Storywriting for Beginners

Software: Story Machine
Grades: K–4
Machines: Apple II Plus, Atari 800 (48K); IBM Personal Computer (64K)

Program Description

With the help of *Story Machine*, primary children can write grammatical sentences with correct spelling from the moment they turn on the computer. Students construct their stories from a list of 45 sight words, using a maximum of four sentences. As each sentence is typed in, it appears on the lower part of the monitor screen. If students make spelling or grammatical errors, the program erases them and waits for corrections. To the delight of young writers, as each sentence is completed, it appears in animated form on the top section of the screen.

Story Machine is the basis for the following unit on writing instruction. In the unit, activities are divided into three parts: warm-up activities, activities to do while the program is playing, and extension activities. The material forms a solid writing program that will make primary kids want to write on!

Warm-up Activities

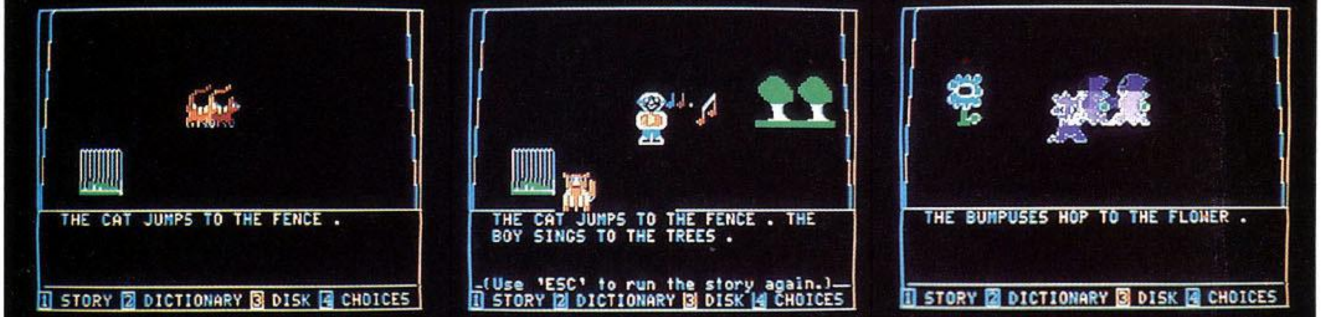
1. ESTABLISH A GOOD WRITING CLIMATE. Many children tense up when they're asked to write. That's because they are unsure of what to write about or are convinced their writing won't be any good. These activities can help develop confidence and provide story ideas:

- Have pairs of classmates interview each other during the first days of school. Then direct each partner to introduce the other to the class.
- Encourage each student to tell about an experience that shows "I'm proud of me!"
- Take an informal interest-inventory and find out what your kids like to do. Tune into their conversations and note what they reveal in moments of excitement, sorrow, or other strong emotion. Later, be ready to draw upon your "research" when it's time to help students find subjects to write about.
- Enter into the writing process yourself, sharing your failures and successes as a writer.

2. TURN STUDENTS INTO KEEN OBSERVERS. Writers write to discover something about themselves and the world in which they live. To get an accurate picture, they need to focus on specific details—and that requires careful observations. Try these observation activities:

- Build a sensorium. Start a classroom collection of interesting items like an ant farm, aromatic candles, assorted hats, empty seed packets, fabric swatches, jewelry, and menus from local restaurants. Choose one item from the sensorium each day and have kids name all the specific details they can think of concerning it. How does it look, feel, smell, and so on? List observations on the board.
- Have your class visit the same area of your school grounds on the same day of the week for three consecutive weeks. Ask kids to pick out their own small spot on the site, perhaps a tree trunk or a hole. Each time, have them draw pictures of their spot. Discuss how details of their three drawings differ.

3. INTRODUCE THE *STORY MACHINE'S* 45 VOCABULARY WORDS. Display them on a chart or chalkboard and encourage kids to talk about the words. For example, do your students associate facts or stories with the word *cat* or *store*? What about *dance* or *jump*?



```
THE CAT JUMPS TO THE FENCE .
```

```
THE CAT JUMPS TO THE FENCE . THE
BOY SINGS TO THE TREES .

(Use 'ESC' to run the story again.)
```

```
THE BUMPUSES HOP TO THE FLOWER .
```

Sample story from *Story Machine*. Animation appears on the top of the screen while the story words appear on the bottom.

This kind of discussion helps generate future story ideas.

4. DISCUSS THE PROGRAM RULES. Just before you load the program, tell students that each sentence they write on the computer must begin with an article, be followed by a noun, then a present tense verb, and then a period or prepositional phrase. (If children need help distinguishing parts of speech, hand out photocopies of the Dictionary Card that accompanies *Story Machine's* documentation. It labels the vocabulary words accordingly.)

Also tell students about these rules:

- Use only words from the word bank (called the Dictionary).
- Stories cannot be longer than four lines.
- You cannot have more than four actors (characters) per story.
- For the animation to work, actors on the screen must not block the path of another actor's actions. This can happen sometimes. When it does, the story must be revised a bit. (For details, read the Quick Reference Card that accompanies documentation.)

Program Activities

1. LOAD THE PROGRAM. Show students how to type their sentences onto the screen, how to use the program's dictionary, and then leave them alone to write.

2. TEACH STUDENTS THE FINE ART OF REVISION. Once a child's three or four sentences appear on the screen, he or she may think the story is written. Not so! Writing is a thinking process that calls for many revisions of ideas and word usage. Here are some guidelines for revising and fine-tuning:

- First draft—Have students read their own story and ask themselves these questions: Does the story make sense? Is it as interesting as it could be? Did I use the best words possible? If the answer to any of the questions is no, students should revise accordingly.
- Second draft—Have a teacher or peer read the story and ask the previous evaluation questions. Students should revise according to the reader's feedback.
- Third draft—Have students copy their story onto paper. (They may even wish to illustrate it.) Then have them "proofread" for word omissions and proper spelling and punctuation.

Extension Activities

1. FIND WAYS TO "PUBLISH" THE STORIES THAT CHILDREN JUST WROTE. Students need to be responded to. This kind of response can come from a teacher, but it's often more valuable when it comes from a source students feel is not duty-bound to respond, like from the principal or from peers. Try one of these:

- Let writers read their papers to another class.
- Frame outstanding pieces and hang them in a gallery.
- Establish a "Readers Wanted" folder in which students file drafts they wish others to review.
- Submit selected pieces to a school newsletter.
- Start a classroom literary magazine.
- Submit stories to local newspapers.
- Request public affairs air time on a local radio station so that students may read their work.

2. ENCOURAGE KIDS TO WRITE, WRITE, WRITE. Research shows that the more time students spend in actual writing, the better writers they become.

- Send kids back to the computer to write sequels to their stories.
- Or, have students write a variety of stories that could be compiled into a class storybook.
- On paper, help students convert their stories into radio dramas.
- Let *Story Machine* drill students on the parts of speech. Using vocabulary from the program's dictionary, give kids jumbled sentences and tell them to rearrange the sentences so that an article comes first, then a noun, then a verb, then a period or a prepositional phrase. Have students check their answers by typing their new sentences onto the *Story Machine* window. If a sentence is correct, it will become animated. For example: "Goes cat girl to the." Answer: "The girl goes to the cat," or "The cat goes to the girl." Either sentence will produce corresponding animation. Explain to students that in many cases, more than one answer will be correct, but that they need only supply one answer.

Program Information

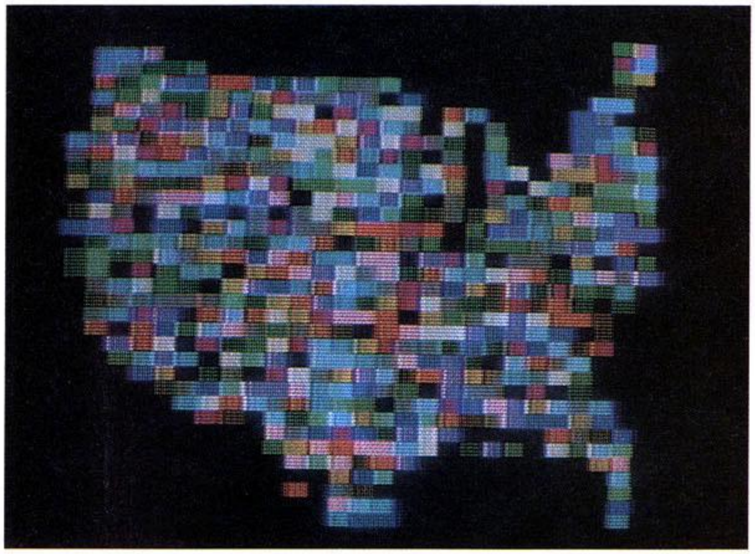
Producer: Spinnaker Software, 26 Brighton St., Belmont, MA 02178.

Price: $34.95

OTHER RELATED MATERIAL

- *Creative Story Starters II*, by Lorna Grant (Developmental Learning Materials, One DLM Park, Box 3000, Allen, TX 75002; 1980.) Each book lists more than 100 story ideas. For grades 3-6.
- *Language Experience Activities*, by Roach Van Allen and Claryce Allen (Houghton Mifflin Co., One Beacon St., Boston, MA 02108; 1982). Gives 250 activities for developing communication skills, plus directions for setting up centers on writing, language study, dramatization, and reading. For all elementary levels.
- *The Sentence Family* and *Let's Write Descriptively* (Troll Associates, 320 Route 17, Mahwah, NJ 07430; 1980). Both sets contain filmstrips and cassettes that help develop interest in creative writing. For grades 4-6. □

Exploring American History



Computer Graphic by James Sarfati

Software: History Star
Grades: 5 and up
Machines: Commodore 64, PET (32K 1 cassette); Apple II Plus (48K 1 disk)

Program Description

HISTORY STAR is a game that drills students on American history facts. It is played between two individuals or two teams. In either case, the two sides take turns answering history questions. There are 10 question categories: Black Americans, the Constitution, Expansion, Explorers, Indians, Inventors, Pioneers, Presidents, Wars, and Women.

For each game, the computer randomly selects five of these categories. On each turn in the game, three category names from the five categories will flash in windows on the screen. The word "star" also might appear in a window. This is a "wild card" and means the player or team may select a question from any of the five game categories.

The player or team chooses a category by typing its number. Then the computer randomly selects and types a question from the chosen category. There are 200 questions in the data bank. No question is ever repeated if there is another question in that category that has not been used. All the questions are the fill-in type.

Playing *History Star* is the highlight of the following unit on American history. In the unit, activities are divided into three parts: warm-up activities, program activities, and extension activities.

Background Activities

Before students actually play *History Star*, jog their memory and fill education gaps by asking each student to do a history project based on one of the program's 10 history categories. (See that each category is covered.)

Once the projects are completed, have students share their work with the rest of the class. Here are a few history suggestions.

1. Black Americans

- Folktales and storytelling are part of a rich tradition Africans brought to America. Read tales from *The Knee-High Man and Other Stories* by Julius Lester (New York: Dial, grades 2–4) or from *The Days When the Animals Talked: Black American Folktales and How They Came to Be* by William J. Faulkner (Chicago: Follett, grades 4– 6). Then tell your favorite story to the class.
- Why was Harriet Tubman called the Moses of her people? Write a short biography of her life. Describe her work with the Underground Railroad.

2. Constitution

- Read the first amendment to the Constitution of the United States. List 25 ways your life would be different if your rights under the first amendment were not protected.
- In order to be a president, vice president, senator, or congressperson of the United States, certain requirements must be met. The requirements are described in the Constitution. The Constitution also outlines the duties of each position. Read this information, then design a classified advertisement page containing four ads for federal job openings: one for the president, one for the vice president, one for a senator, and one for a member of Congress. In each ad, describe the job's responsibilities and requirements.

3. Expansion

- Westward expansion steamrolled with the installation of the Iron Horse. What was this creature? Write a poem about its importance in American history.
- In 1867 Secretary of State William H. Seward paid Russia $7,200,000 for Alaska. Many Americans opposed the purchase, calling it "Seward's Folly." The purchase, however, turned out to be very important. Write William Seward a letter of thanks and tell him why his judgment was correct.

4. Explorers

- There is a lot more to know about Christopher Columbus than the mere fact that he landed in North America in 1492. For example, did you know that in 1476 he was shipwrecked off the coast of Portugal, or that he was given the title "Admiral of the Ocean" by the king and queen of Spain? Become a Columbus expert by compiling a booklet of 50 facts about him.
- Some explorers, like Samuel de Champlain, were also mapmakers. Find maps made by Champlain and make a replica of one, labeling important settlements, borders, and land forms. Draw a map of the same area as it exists today.

5. Indians

- Read about the following American Indian leaders: Tecumseh, Pontiac, Sitting Bull, Osceola, and Cochise. Find out what Indian nations each leader represented and the part each person played in American history. Give an oral report to the class on your findings.
- Draw a map of American Indian territories in the late 1700s.

6. Inventors

- List 10 of Thomas Alva Edison's inventions. Write the three most important ones at the top of the list.
- Take two American inventions and figure out how to make them better. Draw "blueprints" or plans of your creations. Explain them to the class.

7. Pioneers

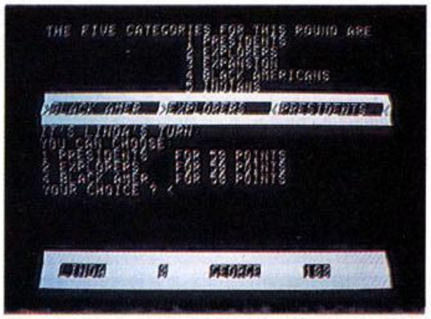
- Most of the early pilgrims' houses in Plymouth, Massachusetts, were small cottages framed with heavy timbers and roofed with thatch. Find out how they were built and furnished inside. Then, using a cardboard shoe box, make a model of a cottage's interior.
- Pioneers first traveled west by wagon train from about 1824 to 1846. Two of the most popular routes were the Oregon Trail and the Sante Fe Trail. Choose one of these trails and pretend your family is traveling by wagon on it during the 1830s. Write three or four journal entries that describe why you are traveling west, the sights you pass, and the dangerous and amusing experiences you have.

8. Presidents

- Who was the first United States president to wear long pants? (James Madison) What president ordered 20 spittoons for the White House parlors? (Andrew Jackson) Compose 15 other trivia questions about U.S. presidents and see if you can stump your classmates.
- Make an entire series of presidential bookmarks. On one side list a president's name, accomplishments, and years in office. On the other, sketch a portrait of him or write one of his most famous quotes.

9. Wars

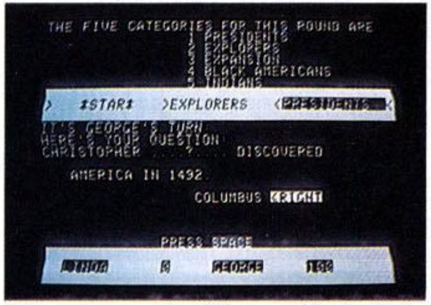
- Draw a historical time line showing at least six events that led to the Revolutionary War.



```
THE FIVE CATEGORIES FOR THIS ROUND ARE
                    1 PRESIDENTS
                    2 EXPLORERS
                    3 EXPANSION
                    4 BLACK AMERICANS
                    5 INDIANS
>BLACK AMER  >EXPLORERS  <PRESIDENTS<
IT'S LINDA'S TURN
YOU CAN CHOOSE
1 PRESIDENTS    FOR [illegible] POINTS
2 EXPLORERS     FOR [illegible] POINTS
4 BLACK AMER.   FOR 50 POINTS
YOUR CHOICE ? <

LINDA      0      GEORGE      100
```

On each player's turn, three category names from the game's five categories flash in windows on the screen. The player chooses one.



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THE FIVE CATEGORIES FOR THIS ROUND ARE
                    1 PRESIDENTS
                    2 EXPLORERS
                    3 EXPANSION
                    4 BLACK AMERICANS
                    5 INDIANS
>   *STAR*    >EXPLORERS    <PRESIDENTS<
IT'S GEORGE'S TURN
HERE'S YOUR QUESTION
CHRISTOPHER ....?.... DISCOVERED
  AMERICA IN 1492.
                 COLUMBUS <RIGHT

              PRESS SPACE
LINDA      0      GEORGE      100
```

All questions are the fill-in type. Nearly all the answers are single words.

- In the 1930s, Eleanor Roosevelt was mother, wife, politician, stateswoman, journalist, and First Lady all at once. "Her glow warmed the world," said one diplomat. Compose your own tribute to Eleanor Roosevelt in the form of a poem, song, essay, or drawing.
- Interview a relative, neighbor, or friend about his or her experiences during the Vietnam War, Korean War, World War I, or World War II. Take careful notes during the interview so that later you can write a short version of the interview.

10. Women

- What important contributions did these American women make in the field of science: Helen Taussig, Maria Mitchell, Ellen Richards, and Sally Ride? List these women and their accomplishments along with the names and scientific accomplishments of at least 10 other American women on a scroll called "The American Women-in-Science Honor Roll."

Program Activities

1. Give kids a feel for how *History Star* works by letting them play the game on a one-to-one basis first.
2. Once every child has had a chance to play, divide the class into two teams. Choose one member from each team to sit at the computer and type in commands, read the question, and type in his or her team's response. The whole team may confer on the answer. If students know their stuff and the game goes quickly, have the two teams play for the best out of five games. At the end of each game, rotate the typist jobs.
3. If students are especially weak in some categories, encourage them to play the game at another time with one partner, and to select their weak categories any time they appear in the window.

Extension Activities

1. As a class, construct a time line of American history's most important events. (See if you can cover all 10 game categories.)
2. In a corner of your classroom, set up an American Hall of Fame. Have kids select 25 to 30 important Americans. Assign one selection to each child and ask him or her to write a brief report on that great American and to draw or acquire a picture of the person. Display the pictures and reports on the wall in historical sequence.
3. Investigate the history of your own area. Invite a resident historian to talk to the children or take a field trip to a local historic site.
4. Have students complete the *History Star* worksheet. Answers to worksheet: Abraham Lincoln, wristwatch on Lincoln, Manhattan skyline, typewriter, wrong date on Declaration of Independence, wrong flag, electric light, briefcase and umbrella stand, sneakers and modern necktie on Franklin.

Program Information

Producer: Island Software, Box 300, Lake Grove, NY 11775.

Price: $20.

Related Programs:

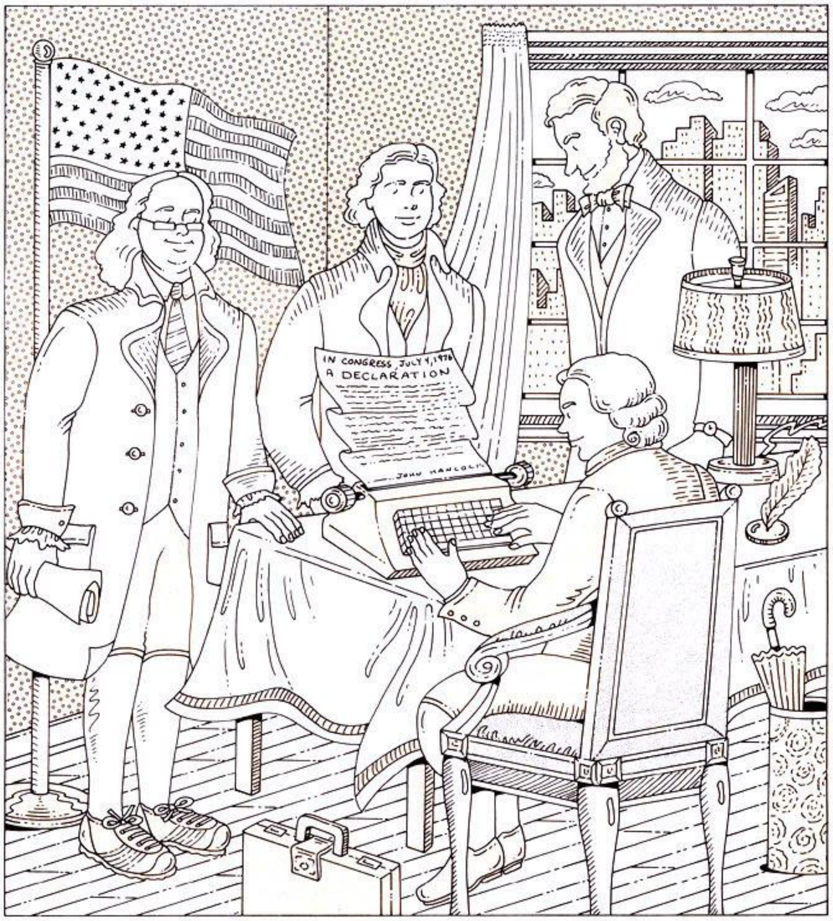
Growth of United States, for Apple (6K, disk) and Pet (8K, 1 cassette), grades 4 and up, $15. Right On Programs, PO Box 997, Huntington, NY 11743.

U.S. History, for TRS 80 I–III (16K, cassette), grades 5–10, $19.95. Demi-Software, 6 Lee Road, Medfield, MA 02052.

Word Draw: Famous Americans, for Atari 400, 800 (16K, 1 cassette; 24K disk), grades 2–7, $19.95. Edupro, PO Box 51346, Palo Alto, CA 94303. ☐

Name____________________________

The Signing of the Declaration of Independence



There are 10 history mistakes in the picture above. Draw a ring around each mistake.

Rewrite American History

Choose one of the characters from the first column, and one of the events from the second column. Rewrite the historic event so that your character plays an important part.

Write your story on the back of this paper.

Paul Revere
Pocahontas
Abraham Lincoln

The First space shuttle launch
Invention of the telephone
The Louisiana Purchase

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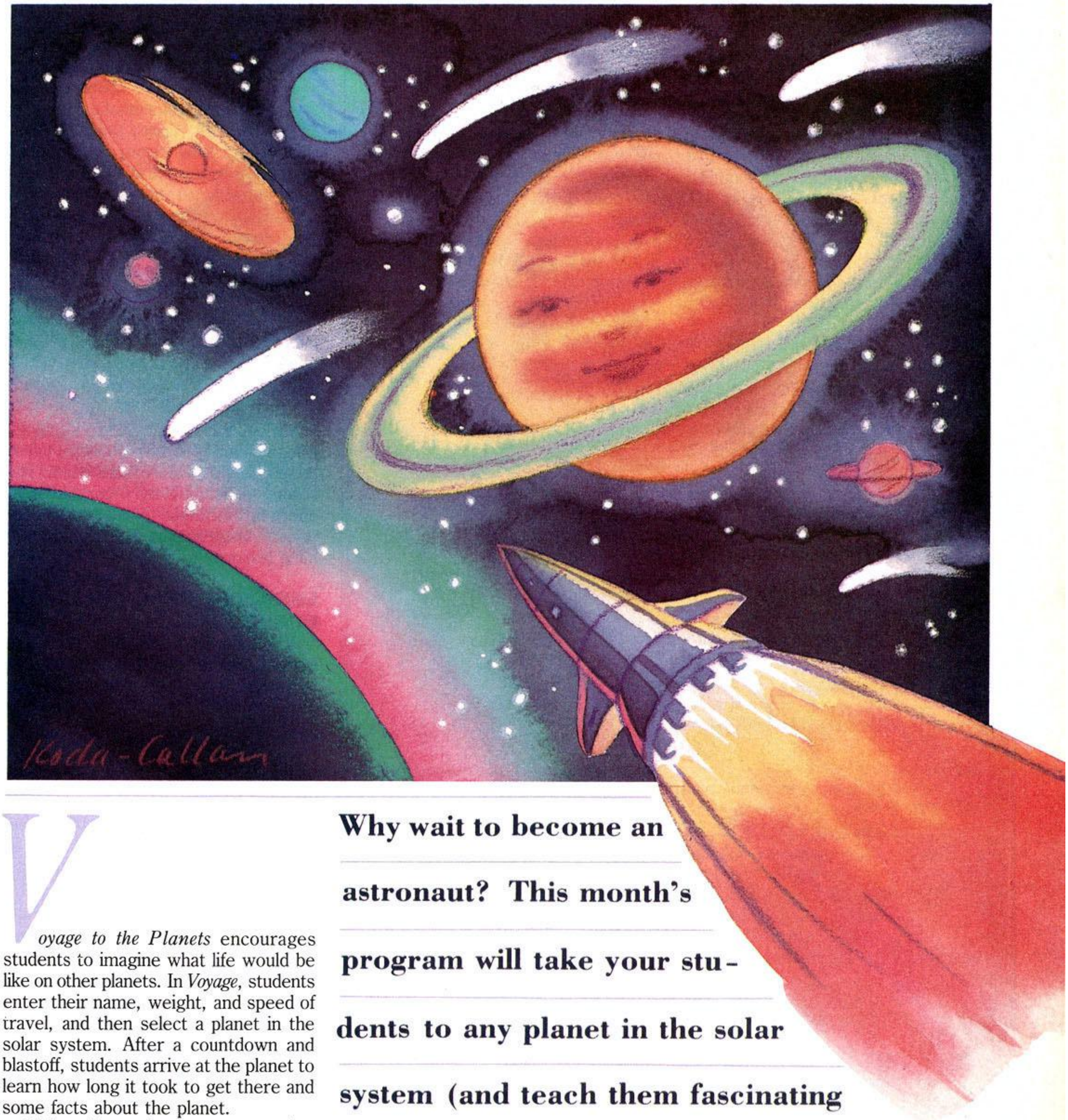
VOYAGE TO THE PLANETS



Why wait to become an astronaut? This month's program will take your students to any planet in the solar system (and teach them fascinating facts, too!)

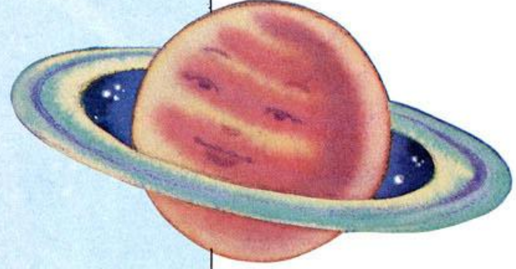
Voyage to the Planets encourages students to imagine what life would be like on other planets. In *Voyage*, students enter their name, weight, and speed of travel, and then select a planet in the solar system. After a countdown and blastoff, students arrive at the planet to learn how long it took to get there and some facts about the planet.

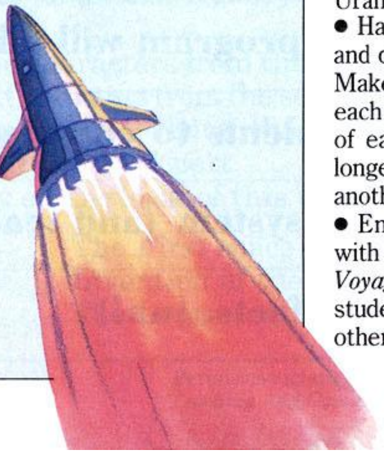
This guide to the program contains two sections. The first section, Using the Program in the Curriculum, is for all teachers—from non-programmers to

Continued

```
]LIST

10  REM  VOYAGE TO THE PLANETS
20  PRINT "YOU CAN TRAVEL TO ANY PLANET"
30  PRINT "IN THE SOLAR SYSTEM!"
40  PRINT "WE WILL TELL YOU HOW LONG IT TOOK"
50  PRINT "AND SOME FACTS ABOUT YOUR NEW HOME."
60  PRINT "WHAT IS YOUR NAME?"
70  INPUT N$
80  PRINT "HOW MUCH DO YOU WEIGH IN EARTH POUNDS?"
90  INPUT W
100  PRINT "AT WHAT SPEED WOULD YOU LIKE TO TRAVEL (IN MPH)?"
110  INPUT S
120  IF S > 186000 THEN  PRINT "YOU CAN'T GO THAT FAST!": GOTO 100
130  HOME
140  PRINT "WHAT PLANET WOULD YOU LIKE"
150  PRINT "TO VISIT TODAY, COMMANDER ";N$;"?"
160  PRINT "      1) MERCURY"
170  PRINT "      2) VENUS"
180  PRINT "      3) MARS"
190  PRINT "      4) JUPITER"
200  PRINT "      5) SATURN"
210  PRINT "      6) URANUS"
220  PRINT "      7) NEPTUNE"
230  PRINT "      8) PLUTO"
240  PRINT "TYPE IN THE NUMBER OF YOUR PLANET:"
250  INPUT P
260  IF P > 8 THEN 140
560  HOME
570  ON P GOTO 600,700,800,900,1000,1100,1200,1300
600  PRINT "WELCOME TO MERCURY, COMMANDER ";N$;"!"
610  PRINT "IT TOOK YOU ";57000000 / S;" HOURS TO GET HERE."
620  PRINT "YOU WEIGH ";.37 * W;" POUNDS ON MERCURY."
630  GOTO 2000
700  PRINT "WELCOME TO VENUS, COMMANDER ";N$;"!"
710  PRINT "IT TOOK YOU ";25000000 / S;" HOURS TO GET HERE."
720  PRINT "YOU WEIGH ";.89 * W;" POUNDS ON VENUS."
730  GOTO 2000
800  PRINT "WELCOME TO MARS, ";"COMMANDER ";N$;"!"
810  PRINT "IT TOOK YOU ";48000000 / S;" HOURS TO GET HERE."
820  PRINT "YOU WEIGH ";.38 * W;" POUNDS ON MARS."
830  GOTO 2000
900  PRINT "WELCOME TO JUPITER, COMMANDER ";N$;"!"
910  PRINT "IT TOOK YOU ";390700000 / S;" HOURS TO GET HERE."
920  PRINT "YOU WEIGH ";2.64 * W;" POUNDS ON JUPITER."
930  GOTO 2000
1000  PRINT "WELCOME TO SATURN, COMMANDER ";N$;"!"
1010  PRINT "IT TOOK YOU ";762700000 / S;" HOURS TO GET HERE."
1020  PRINT "YOU WEIGH ";1.16 * W;" POUNDS ON SATURN."
1030  GOTO 2000
1100  PRINT "WELCOME TO URANUS, COMMANDER ";N$;"!"
1110  PRINT "IT TOOK YOU ";1700000000 / S;" HOURS TO GET HERE."
1120  PRINT "THE TEMPERATURE ON URANUS IS ABOUT -357 DEGREES!"
1130  GOTO 2000
1200  PRINT "WELCOME TO NEPTUNE, COMMANDER ";N$;"!"
1210  PRINT "IT TOOK YOU ";2700000000 / S;" HOURS TO GET HERE."
1220  PRINT "THE TEMPERATURE ON NEPTUNE IS ABOUT -360 DEGREES!"
1230  GOTO 2000
1300  PRINT "WELCOME TO PLUTO, COMMANDER ";N$;"!"
1310  PRINT "IT TOOK YOU ";3583000000 / S;" HOURS TO GET HERE."
1320  PRINT "THE TEMPERATURE ON PLUTO IS ABOUT -300 DEGREES!"
1330  GOTO 2000
2000  PRINT : PRINT
2010  PRINT "DO YOU WANT TO VISIT ANOTHER PLANET"
2020  PRINT "IN THE SOLAR SYSTEM (Y/N)?"
2030  INPUT Q$
2040  IF Q$ = "Y" THEN 130
2050  HOME
2060  PRINT "NICE TRAVELING WITH YOU, "
2070  PRINT "COMMANDER ";N$;"!"
2080  PRINT "SEE YOU NEXT TRIP..."
2090  END
```





Program of the Month *continued*

programming experts—who want to use the program as a tool of instruction. The second section, A Programming Lesson, offers tips for those teachers who want to use *Voyage* as part of their programming lessons.

USING THE PROGRAM IN THE CURRICULUM

The following activities work well as either preparatory or follow-up lessons to *Voyage*.

Science:

- Place a map of the universe near the computer for reference both before and after blasting off. Have students identify planets by name and sight.
- Locate photos from magazines and books of planet and moon surfaces. What materials are present on the surfaces? (Rocks, sand dunes, craters, dust, volcanoes, and possibly diamonds on Uranus and Neptune!)
- Have students compare planet years and days, densities, and temperatures. Make a bar graph showing the length of each planet's year and day and the size of each planet. Which planet has the longest year? The shortest day? Make another graph comparing temperatures.
- Encourage students to experiment with different weights and speeds in *Voyage*. Draw a chart showing each student's weight on Earth and on all the other planets.

- Discuss planet atmospheres. Are these elements found on Earth, too? (Yes, but in different quantities and mixtures.)
- Have each student choose a planet and write a report.
- Discuss the possibility of life on other planets. Where is life most likely to occur? (Mars, Jupiter, and Titan, Saturn's largest moon) What does life need to exist as we know it? (Water, breathable air, food)
- Have students take turns traveling to a planet using *Voyage*. After each visit, students can record what they learned in a notebook. When everyone has had a turn, have students compare notes and then start a new round in which students visit their second favorite planet. Continue until each student has visited the eight planets and has a notebook of facts on each.

Language Arts:

- Assign a story about life on another planet. How and in what year was life discovered? What does it look like? How does it cope with the atmosphere and temperature?
- Ask students to suppose they were the first people to explore space. Where would they go? Would they want to live on another planet? What would they take with them? Tell students to write a journal of their adventures.

Social Studies:

- What year was each planet discovered? Create a time line showing all the dates, plus the dates when Earth ships explored Mars, Venus, Jupiter, and the moon.
- Assign a report on a famous astronomer. Compare what he or she knew about the planets to what scientists know today.

Math:

- As a class, make a map showing the planets' orbits. For each planet, write in how long it takes to spin around once, how long to orbit the sun, and the average distance from the sun. Are all the planets on the same plane? (Most encyclopedias will have this data.)

A PROGRAMMING LESSON

Print out copies of the program listings and distribute them to students. Divide the program into sections and examine each group of instructions. Here's how:

Lines 10-120: These lines introduce the program and ask for the player's name (N$), weight (W), and selected rocket speed (S). What happens if you decide to go too fast?

Make It Better: Challenge students to program a title page with graphics. As a class, invent a story to go along with the program (In the year 2500, Earthlings found the key to unlock the mystery of the planets . . .) Each student enters part of the story into the program.

Lines 140-260: Players select a planet. What does line 260 do?

Make It Better: Challenge students to add the sun, moon, asteroids, comets, and other stars to the list. Remember to change the '8' in line 260 to the maximum number of choices. Also change lines 140-150 to read "What part of the universe would you like to visit today?"

Lines 270-550: These lines provide a sample countdown and blastoff. Challenge students to create their own countdown and blastoff. Show the rocket traveling through space.

```
270  FOR J = 10 TO 1 STEP - 1
280  HOME
290  PRINT J
300  FOR T = 1 TO 500
310  NEXT T
320  NEXT J
330  HOME
340  FOR K = 1 TO 20
350  NEXT K
360  PRINT "     *"
370  PRINT "    * *"
380  PRINT "   *   *"
390  PRINT "   *   *"
400  PRINT "   * U *"
410  PRINT "   * S *"
420  PRINT "   * A *"
430  PRINT "   *   *"
440  PRINT "   *   *"
450  PRINT "   *   *"
460  PRINT "  *     *"
470  PRINT " *       *"
480  PRINT " * ***** *"
490  PRINT " **     **"
500  PRINT " *       *"
510  FOR K = 1 TO 25
520  PRINT
530  FOR L = 1 TO 100
540  NEXT L
550  NEXT K
```

Lines 570-1330: Facts on the planets. Explain that line 570 contains eight numbers to correspond to the eight planet choices. The first number, 600, corresponds to the first planet, Mercury. To what line does the program go if the player chooses planet #4 (Jupiter)? Planet #7 (Neptune)?

Make It Better: If you added more items to the list, be sure to enter corresponding numbers on line 570. Enter facts for these items starting with line 1400.

Using the planet reports prepared earlier, have students insert more information on each planet. For example, under Venus (line 700), add:

730 PRINT "THE TEMPERATURE ON VENUS IS A WHOPPING 850 DEGREES!"
740 PRINT " I HOPE YOU BROUGHT AN OXYGEN TANK. THE ATMOSPHERE IS FULL OF CARBON DIOXIDE!"
750 GOTO 2000

Remember to end each planet section with GOTO 2000; otherwise, you'll visit more planets than you bargained for!

Challenge advanced students to show the rocket landing. Can you put volcanoes and a polar ice cap on Mars? How about rings around Saturn?

Lines 2000-END: These lines allow you to visit another planet. What happens if you say no?

Make It Better: Show the rocket landing back on Earth. As a class, write similar programs for exploring other countries, going on an expedition to the North or South Pole, and sightseeing at a favorite vacation spot.

VARIABLE CHART

Here's a quick explanation of the variables used in *Voyage*:

N$ = Name of player
W = Weight of player
S = Rocket speed
J = Countdown timer
T = Timing loop index
K = Loop counter (moves rocket up)
P = Planet choice
P1$-P8$ = Planet names
Q$ = End program or visit another planet

PROGRAM MODIFICATIONS

The program listing is for Apple II computers. For other machines, change lines 130, 280, 330, 560, and 2050 to the following:

Atari: PRINT "(press ESC once, then press CTRL and CLEAR at the same time)" You should get an arrow pointing up and to the left.

Commodore 64, PET, VIC-20: PRINT "(Press the SHIFT key and the CLEAR key at the same time)" You should get a heart.

IBM Personal Computer: CLS

TI 99/4A: CALL CLEAR

Timex Sinclair: CLS

TRS-80 MODELS I/III, Color Computer: CLS □

Program By Wae Hon Ng and Kuo Heng Fung

Wae Hon Ng and Kuo Heng Fung are elementary students from Bronx, NY.

Enhancements by Marlin Heckendorn

Marlin Heckendorn is an elementary teacher at Stedwick Elementary School in Gaithersburg, MD.

Logo Notebook

Lesson One: **Introductory Activities**

by Tom Lough and Steve Tipps

LOGO WHICH COMES FROM THE Greek word *logos* ("thought" or "word"), is a programming language with a special philosophy. This philosophy is called discovery learning; it draws on Jean Piaget's theory that people learn by doing. In this case, children acquire thinking skills and new information by giving the computer instructions.

The Logo programming language is also procedural in nature, meaning that it allows problems to be broken down into mind-sized bites or procedures. These procedures can be used like building blocks to create more complex and sophisticated programs.

The three basic components of Logo are: turtle graphics, arithmetic, and list processing (the ability to manipulate words and lists). Turtle graphics, created by simple commands, is the most widely used, particularly in elementary schools.

Full-scale Logo packages currently exist for the Apple II, TI 99/4A, Commodore 64, and Atari 800. Modified Logo versions that emphasize turtle graphics are available for the Apple II, TRS-80 Color Computer, Atari 400/800, IBM Personal Computer, PET, VIC-20, and Commodore 64.

Each month, Tom Lough and Steve Tipps will present a developmental lesson that will help your students discover Logo. Tear out the monthly lessons and place them in a spiral notebook. You'll have a complete series of Logo lesson plans by the end of the year!

1. MOTHER/FATHER MAY I?

Objective: Students follow directions and use precise commands for moving forward and back.

Children line up at one end of the classroom while a leader, "Mother" or "Father," stands at least 15 feet out front. The leader gives forward and back commands like "Take three baby steps forward," "Take one giant step back," and "Go back one medium step" to individual players. The player must respond "Mother (or Father) may I?" or go back to the starting point. The leader then either says "Yes, you may" or "No, you may not." If the leader says "no," he or she then issues a new set of directions.

The first person who reaches the leader's spot becomes the new leader and the game starts over.

2. SIMON SAYS

Objective: Students learn to follow directions precisely for moving forward and back.

The leader gives one command to everyone, some preceded by "Simon Says" and others without it. For example: "Simon Says go forward one medium step. Go back two giant steps. Simon says take four baby steps back, and so on." Students must respond only to those commands preceded by "Simon Says" and ignore other commands; otherwise they return to the starting line. The first one to the front of the class becomes the new leader, and the game starts over.

3. ATTENTION!

Objective: Students combine forward, back, right turn, and left turn commands to move to any point in the room.

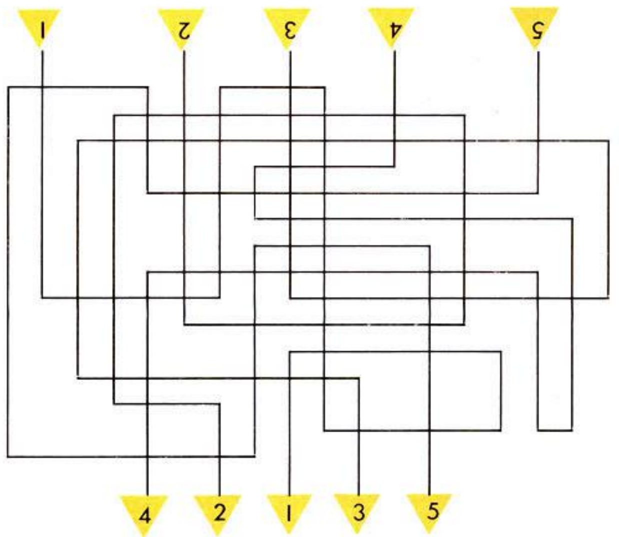
AttenTION!, a marching drill game, introduces LEFT FACE and RIGHT FACE commands. Students stand next to their desk at attention; the leader commands them to turn right or left. After a few turns, the leader adds FORWARD and BACK commands and quickens the pace of the commands. The last step is to add numbers, such as FORWARD 8 or BACK 4. As a final exercise, have a leader issue commands to sections of the class so that students end up in a circle, a square, or in a line in front of the chalkboard.

Teaching Tips: If you spot students moving forward or backward or a RIGHT FACE/LEFT FACE command, point out that they have actually acted out two separate commands. Explain that 90 degree turns do not generate movement; they just set the direction for later movement.

4. THE TURTLE SCRAMBLE

Objective: Students can trace a predetermined path using the FORWARD, BACK, RIGHT, and LEFT commands.

Using masking tape, lay out several twisting, interconnected paths. (See sample.) As children go from start to finish along the paths, they shout out a command for each movement they take (FORWARD 3, RIGHT FACE, FORWARD 4, LEFT FACE, and so on.).



Teaching Tips: Challenge students to try the Turtle Scramble with eyes closed. Another fun variation is to have one person shout commands to a blindfolded partner.

5. SIMON DEGREED

Objective: Students understand the concept of degrees in right and left commands.

Simon Degreed is a variation of Simon Says. Students stand in an open space and draw a chalk circle—divided into four 90 degree quadrants—around themselves. The leader issues commands (RIGHT 90, LEFT 180, and so on), and students turn one quadrant for 90 degrees, two for 180, and so on. After a few rounds, divide the quadrants in half, so that there are eight sections. Introduce commands for 45 degree turns. As students become proficient, add 30 and 60 degree turns and erase the chalk circle.

Teaching Tips: Simon DeGreed introduces degrees directly. If you prefer students to discover degrees on their own, skip this activity. In either case, we recommend postponing headings (north, south, etc.) until later.

6. MAKING TRAKS

Objective: Students learn to organize the basic commands into short programs. One of the most popular pre-Logo learning toys is Big Trak*, a battery-driven programmable vehicle distributed by Milton Bradley. By pressing a series of buttons to go forward, back, right, or left (located on a small control panel), students make Big Trak move the same way they have been practicing themselves. On Big Trak, however, the commands can be entered all at once and executed later, introducing the concept of programs and procedures.

For example, pressing FORWARD 5; LEFT 2; BACK 1; GO will make the Big Trak rumble forward about five feet, turn left a little, then back up a bit. (The amount of movement per command depends on the texture of the floor. Keep Big Trak on the same surface for consistent results.)

Attach a magic marker on the back of Big Trak and have Big Trak draw lines on sheets of paper spread on the floor. Note that, because the marker is at the back, and not the center, turns will be rounded.

As students become proficient at moving Big Trak around, challenge them to try it on the Turtle Scramble (See activity 4). Place obstacles around the room, such as a small piece of carpet, a desk, books, and a chalkboard eraser and have students program Big Trak for a mission, such as carrying a load of "logs" (pencils or sticks) to the "sawmill".

Big Trak is ideal for skill contests. Who can get Big Trak to stop closest to the bullseye?

7. FORWARD COMPUTERS!

Objective: Students move the screen turtle using single keystroke commands.

Convert the basic commands to single keystroke commands (F, B, L, R) using a set of procedures called Instant. There are several versions of Instant listed in Logo books and user manuals, but the following procedure will help you get started:

```
TO INSTANT
    MAKE "KEY READCHART
    IF :KEY = "F FORWARD 10
    IF :KEY = "B BACK 10
    IF :KEY = "L LEFT 15
    IF :KEY = "R RIGHT 15
    INSTANT
    END
```

(For Apple Logo, enclose the commands FORWARD 10, BACK 10, LEFT 15, and RIGHT 15 in brackets)

Type the procedure in your computer and then type INSTANT. The computer is now ready to draw! To stop INSTANT and return to normal Logo commands, use CTRL-G (Apple) or the BACK key (Texas Instruments).

8. SLOW, TURTLE, SLOW

Objective: Students can follow turtle movements.

When students first start experimenting with Logo, listen for complaints like:

(RIGHT 1) "Hey! The turtle didn't do anything!"

(RIGHT 300) "That's funny. It turned left!"

(LEFT 300) "Now it turns right when I told it to turn left."

In the first instance, the turtle only moves slightly; in fact, it barely blinks. In the second and third cases, the turtle turns so quickly that the eye can't follow it. A 300 degree turn one way looks like a 60 degree turn the other way!

Slowing the turtle down will make all movements easy to follow. The following procedures will do this for you:

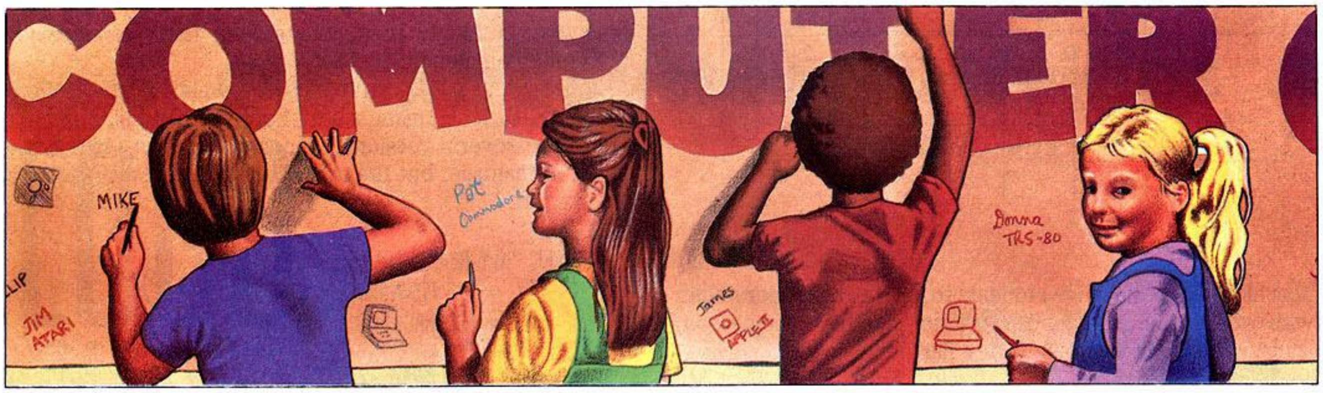
```
TO F :X                          TO B :X
  REPEAT :X [ FORWARD 1 ]          REPEAT :X [ BACK 1 ]
  END                              END

TO L :X                          TO R :X
  REPEAT :X [ LEFT 1 ]             REPEAT :X [ RIGHT 1 ]
  END                              END
```

Tom Lough is editor of the newsletter National Logo Exchange *and assistant professor of physics at Piedmont Virginia Community College in Charlottesville, Va. Steve Tipps is assistant professor of education at the University of Virginia in Charlottesville, VA.*

Micro Ideas

A BONANZA OF BACK-TO-SCHOOL IDEAS



GIVE KIDS A BANNER WELCOME

"Welcome to the computer corner!" That's what I write on a long strip of butcher paper and tape to a wall in my computer area. I provide students with felt-tipped pens and ask them to "sign in" when they enter the computer corner for the first time.

Students not only write their names on the banner, but often embellish it with beautiful borders and computer illustrations. If they have a computer at home, they also write the brand name of the computer under their own name.

Thanks to this activity, kids quickly begin to feel at home in this area of the room, they learn each other's names, and I get an idea of which students are already familiar with computers.

Terry Curtin
Boulder, CO

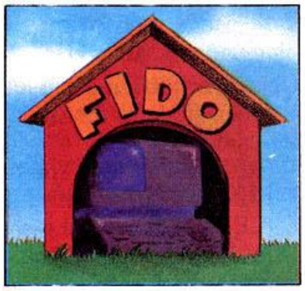
GET READY FOR "TURTLE"

Sometimes primary children have difficulty understanding directionality. The concepts of forward, back, left, and right must be mastered, however, before kids can make figures with turtle graphics.

With the help of a metal board and a magnet (the kind used to hang papers on the refrigerator), you can give young children hands-on experience with directional movement.

Tell kids the magnet is a turtle. (You might even glue paper eyes on it.) Randomly call out the four directions mentioned earlier and have children move "Turtle" accordingly on the metal board. Continue until the exercise is no longer difficult to perform.

Margaret Bauer
Natchez, MS



NAME YOUR COMPUTERS

When we first set up our 12 PET 4016s in the computer lab, we needed a way to identify individual machines. Instead of assigning students to a computer labeled "number one" or "number two," we asked the kids to help us give our PETs "pet names." Fido, Cleo, Duke, and Muffy were among the names children chose to write on the machines' nameplates.

Harriet Pitkof
Valley Stream, NY

QUICK TIPS

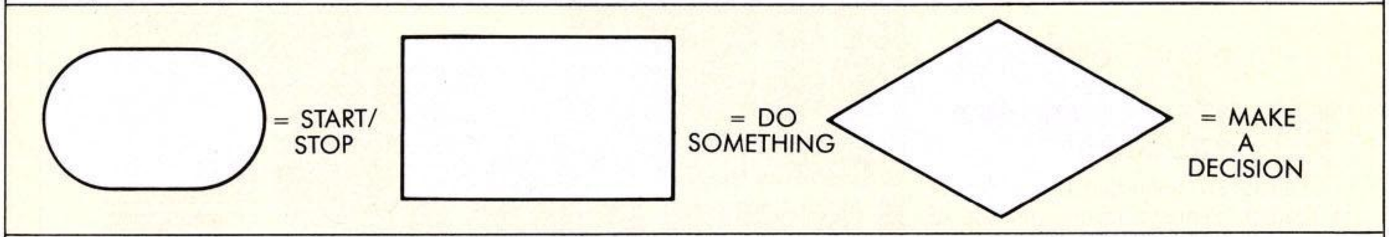
- Always position computers away from window glare.
- Each week add a computer word to students' spelling list.
- If students need a lot of typing practice, but have limited access to computers, ask parents, friends, and neighbors to donate old typewriters.
- Have students practice their penmanship by writing out commands to a favorite program.

Karen Habada
Meadville, PA

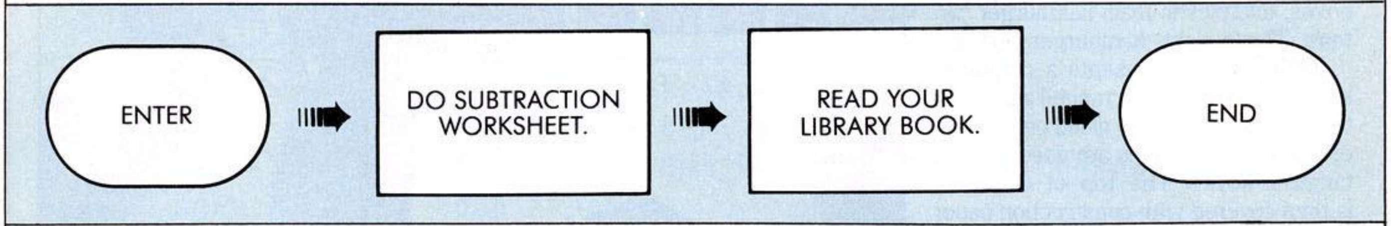
Illustrations by Doron Ben-Ami

CHART YOUR SEATWORK ASSIGNMENTS

This year when you put daily seatwork assignments on the board, do it in the form of a flowchart. Explain that:

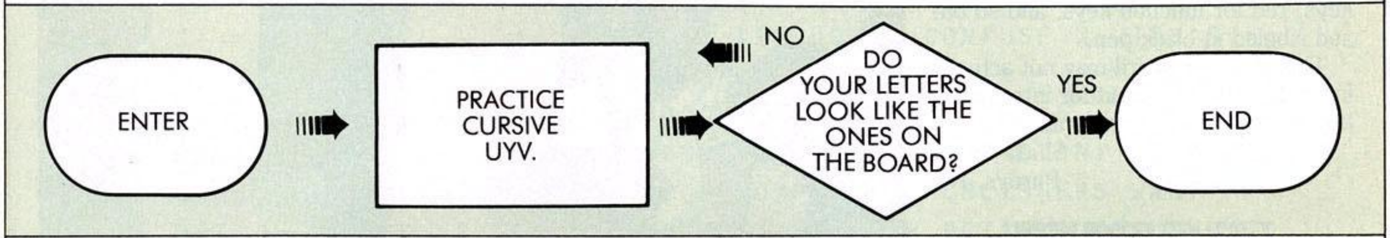


Begin the first day with a simple flowchart:



When the class can handle it, make the flowchart more complicated.

Ada Carnicom Phoenix, AZ



FILL ODD MINUTES AND EMPTY WALLS

During the first few days of school, there are bound to be odd moments when children say, "I've finished my work. What do I do now?" That's when I send them to the computer-buff board. The board contains several different colored paper computers that are pinned to a bright paper background.

Children unpin a paper computer from the wall display and complete the activity written on the back. The activities are designed to develop computer awareness. Here are a few examples:

- Find 5 photos of appliances that use computers.
- Draw an exact replica of a computer keyboard.
- Design a chart that states 5 rules for taking care of disks.
- Make a dictionary of 25 computer terms. (Give correct spelling, punctuation, and a definition for each.)

When children have finished their activity, they are to pin their computer back on the board, and if time allows, can unpin a computer of a different color and start on a new activity.

Ed Nelson
Washington, D.C.

PRACTICE WRITING COMMANDS

To write successful computer programs, one must use precise, step-by-step commands. Give students practice in generating such commands by asking them to write a set of instructions that will tell Robby the Robot how to get a glass of water.

The results may vary a bit, but basically should follow this format: Open the dish cabinet, take out a glass, close the dish cabinet, go to the sink, turn the faucet knob marked "cold," place open end of glass under water, remove before water reaches top of glass, turn faucet knob off.

Discuss what would happen if Robby skipped any of the steps.

Variation idea: Write each step on a separate piece of paper and place in a hat. Have students pick an instruction, read it, and then arrange themselves in a line that shows the correct order for Robby to follow. In proper sequence, have each child pantomime his or her instruction.

Donna Bradford
Towson, MD

TRY EARLY MORNING PROGRAMMING

Every morning I write a short program on the chalkboard in Basic or Logo. As the kids arrive, they study it and write down or draw what they think the screen output will be. After everyone has arrived and had a chance to examine the program, one student runs the program on our classroom computer and the others check their answers.

Sometimes I use programs that my students have written, or I display a program that has a few bugs in it and I ask kids to correct it.

Jane Hummel
Manchester, MO

(Continued)

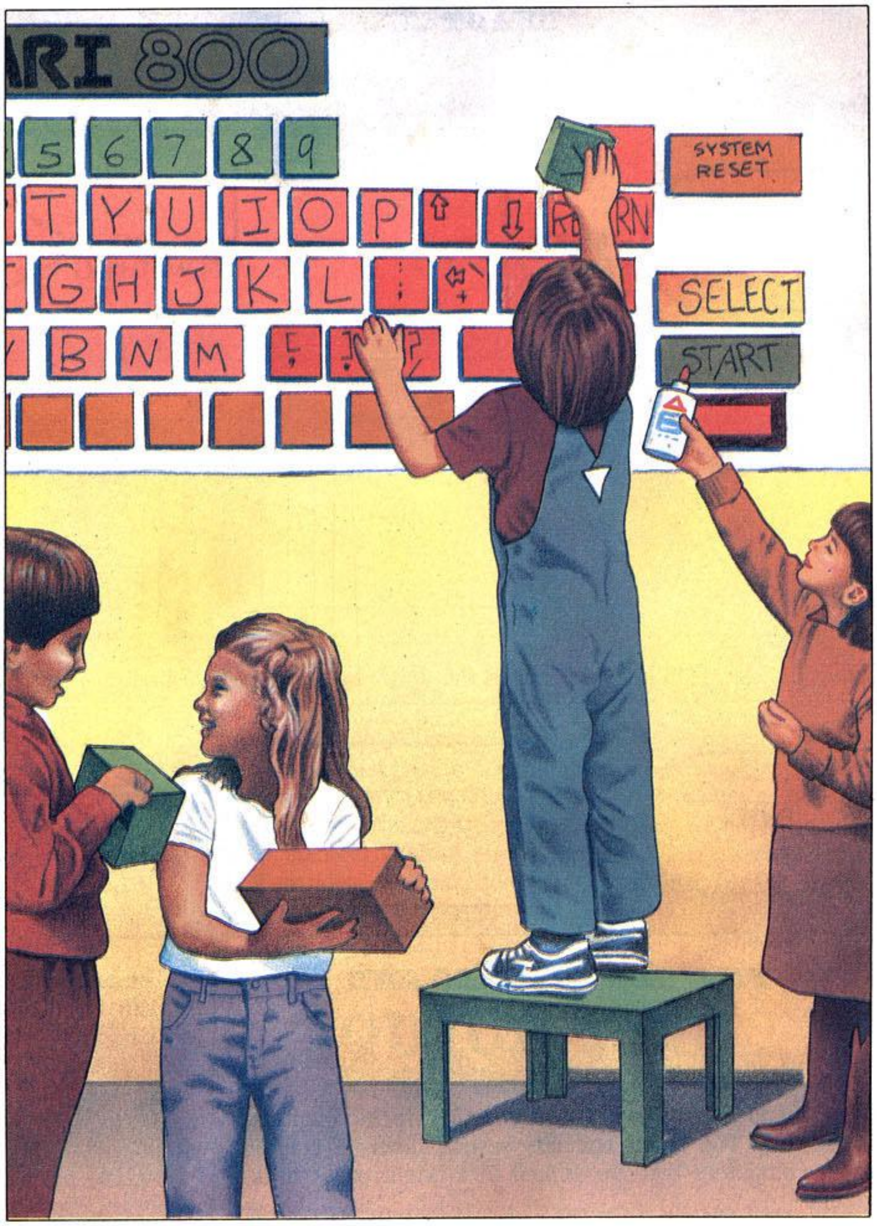
MAXIMIZE KEYBOARD EXPOSURE

Chances are good that Evans School in Yeadon, Pennsylvania, owns one of the world's largest computer keyboards. It's 6′ by 4′ and is made of paper, shoe boxes, and plastic-foam hamburger cartons. That's right, hamburger cartons!

Each carton represents a computer key. The cartons are arranged according to keyboard format and glued onto butcher paper. (Shoe boxes are used for rectangular keys.) The top of each key is then covered with construction paper (color coded according to its purpose: blue for number keys, pink for letter keys, red for function keys, and so on) and labeled in black pen.

This giant keyboard may not actually input data, but it's great for introducing key arrangement to students.

Shiela Swett
Purdys, NY



LET STUDENTS REVIEW SOFTWARE

Looking for a quick way to familiarize students with your entire software library? Assign each child a different piece of software to run and then review in written form. Reviews can be similar to the movie commentaries kids see in the newspapers. They can briefly describe the program's activities, discuss its strengths and weaknesses, and perhaps even rate it on a scale from 1 to 10. Display the reviews on a bulletin board near the computing area. You'll be surprised how quickly students will begin to expand their software use!

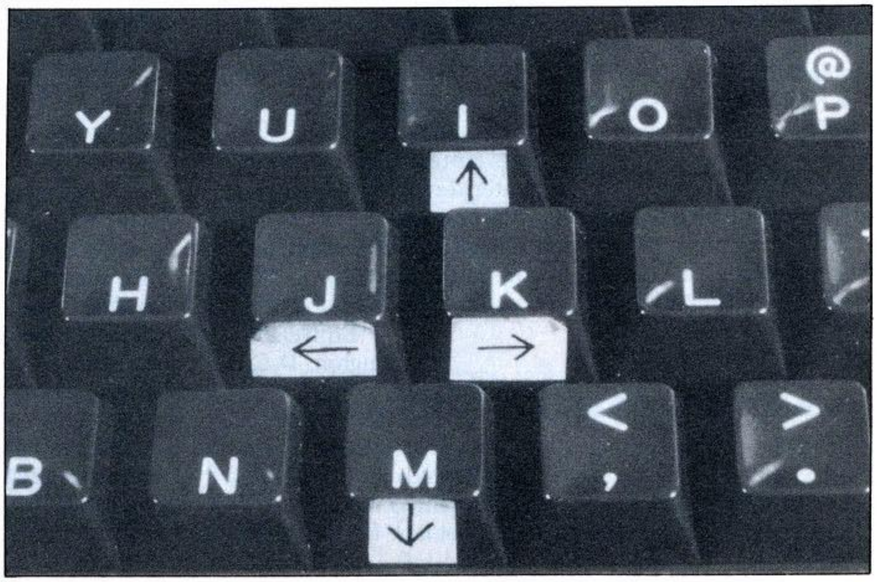
Michelle Rosenthal
Lawrence, NJ

LABEL CURSOR KEYS

Some programs require students to use letter keys to move a cursor. This can be very cumbersome for primary children. You can save young kids a lot of time and frustration by taping directional arrows on the inside, front of the appropriate keys.

Just draw arrows on small bits of masking tape and stick on.

Gerald Booth
Berkeley, CA



Photograph by John Hamamura

programmer s

READ THIS...

```
10  REM PROGRAM FOR WRITING/SELLING YOUR PROGRAMS AND IDEAS
15  REM TO SOFTWARE PUBLISHERS, GAME COMPANIES, OEM'S, ETC.
20  S = $ALEABILITY: O = ORIGINALITY: C = CREATIVITY: GD = GOOD
    DOCUMENTATION
30  E = ENTHUSIASM: P = PERSEVERANCE
40  PGM = PROGRAM: ENV = ENVELOPE: T = TODAY
50  IF  E  =  P  THEN  GOSUB  80:  REM  SOFTWARE  COMPANIES ARE
    SEARCHING FOR GOOD PROGRAMS
60  FOR  X  =  1  TO 10: REM READ CHAPTER ON "THE X FACTOR = 10
    STEPS TO WRITING A $UCCE$$FUL PROGRAM"
70  S  = X + O + C + GD: NEXT X : REM DON'T CONFUSE X WITH S or
    O or C or GD. X = 10 ADDITIONAL FACTORS
80  GET $OFTWARE WRITER'S HANDBOOK
90  PEEK $OFTWARE WRITER'S HANDBOOK: REM FOR IMPORTANT GUIDANCE
    ON WHAT PROGRAMS THE COMPUTER COMPANIES/PUBLISHERS WANT
100 PEEK $OFTWARE WRITER'S HANDBOOK: REM FOR DETAILS ON HOW  TO
    WRITE A $UCCE$$FUL PROGRAM
110 WRITE PROGRAM
120 DEBUG PROGRAM:  REM  READ HANDBOOK CHAPTER "HOW TO DEBUG"
130 PEEK SOFTWARE WRITER'S HANDBOOK: REM READ HANDBOOK CHAPTER
    "HOW TO WRITE CLEAR DOCUMENTATION"
140 WRITE DOCUMENTATION: REM CLEAR DOCUMENTATION IS THE FIRST
    THING PUBLISHER'S LOOK FOR.
150 PEEK $OFTWARE WRITER'S HANDBOOK:  REM  FOR  THE  NAMES  AND
    ADDRESSES OF THE RIGHT PUBLISHERS FOR YOUR TYPE OF PROGRAM
160 POKE PGM + ENV: REM PUT PROGRAM IN ENVELOPE AND MAIL IT  TO
    THE RIGHT PUBLISHERS
170 RETURN: REM RETURN  TO  HANDBOOK  REPEATEDLY  FOR  IDEAS  +
    INFORMATION ON THE WHO/HOW/WHAT OF SELLING YOUR PROGRAMS
180 READ Q: POKE Q + ENV + T: REM FILL IN THE DATA AND SEND FOR
    YOUR COPY OF THE "$OFTWARE WRITER'S HANDBOOK"
190 DATA SEND CHECK OR MONEY ORDER FOR $19.95
200 DATA SORRY, NO C.O.D.'S
210 DATA MAIL TO: SOFTWARE WRITER'S GUILD
220 DATA          P.O. BOX 87
230 DATA          STONY POINT, NEW YORK 10980
240 DATA          (914) 354-5462
250 DATA INCLUDE YOUR NAME, ADDRESS, PHONE #
260 END: REM ACTUALLY A VERY $MART BEGINNING
```

CIRCLE 15 ON READER SERVICE CARD

Software Showcase

Software Recommended For Teachers By Teachers

TEACHERS, media specialists, principals, and other educators have recommended the following software. If you are using a software program that you would like to recommend to other educators, send a detailed description of the program along with your comments on its strengths, weaknesses, and instructional uses to Software Showcase, *Teaching and Computers*, 730 Broadway, New York, NY 10003. We will pay $15 to $25 for each recommendation published.

BASIC MATH SYSTEM H/S

SUBJECT: MATH
LEVEL: GRADES 2–9, PROFESSIONAL
MACHINE: AP

BASIC MATH SYSTEM H (home version) AND S (school version) are designed to cover every math subject encountered by second through ninth graders, including the four basic math operations, ratios, percents, fractions, negatives and elementary geometry. Each teaching module contains a tutorial lesson, drills, reinforcement, and exceptional graphics. Many allow for discovery learning. The modules automatically adjust to individual skill levels— remedial to accelerated —and can zero in on one particular skill. The home version consists of five disks, purchased separately, and the school version consists of an 8-disk set, including three extra management and record keeping disks. I find the software easy and pleasant to work with.

Hardware: Apple II
Price: $59 per disk (home version); $350 for 8 disks (school version)
Policies: Free replacements for first year; 30-day preview
Source: Mathware, 919 14th St., Hermosa Beach, CA 90254

Ann Campbell
Computer Teacher
Kansas City, MO

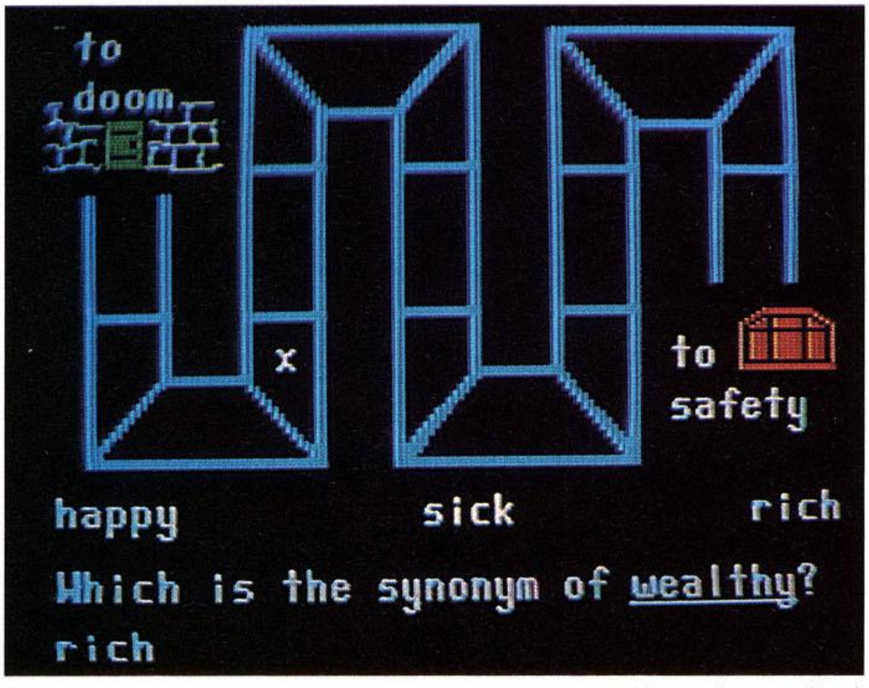
DRAGON GAME

SUBJECT: LANGUAGE ARTS
LEVEL: GRADES 3–6
MACHINE: AP TRS AT C–64 PT

Six tutorial and game-format programs teach nouns, verbs, adjectives, antonyms, synonyms, and contractions. In each program, *Dragon Game* generates a gameboard with a treasure chest at one end and a door behind which lives a menacing dragon at the other. The program then presents a short lesson explaining the subject area and generates questions for practice. Players must answer questions correctly to move ahead one square; incorrect answers move the player back three squares (closer to the menacing dragon). The object is to get enough correct answers to reach the treasure chest. The only problem I found was that some students intentionally gave incorrect answers in order to get eaten by the dragon —a fun graphics display!

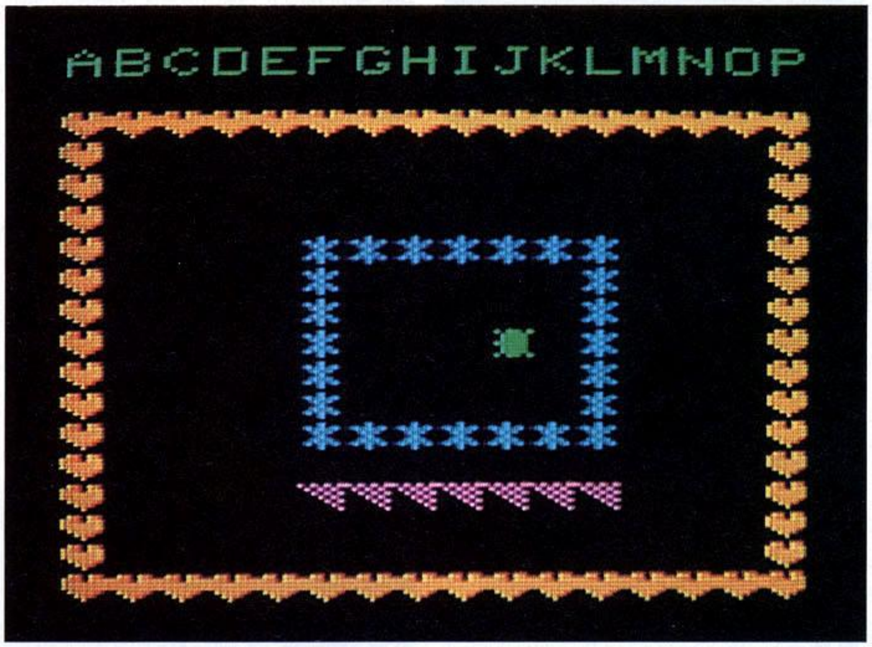
Hardware: Apple II; TRS-80 Model III (cassette and disk); Atari 800 32K disk; Commodore 64; PET 16K (cassette and disk)
Price: $49 for 3 cassettes or 1 disk
Policies: $10 backup; 30-day preview
Source: Educational Activities, Freeport, NY 11520

Edith Carson
Lab Instructor
Amityville, NY



Which is the synonym of wealthy?
rich

The Dragon Game gameboard.



Turtle Tracks graphics.

TURTLE TRACKS (FORMERLY KIDSTUFF)

SUBJECT: PROGRAMMING
LEVEL: GRADES 2-9
MACHINE: VIC AT AP TI

TURTLE TRACKS uses turtle graphics to teach programming concepts like sequencing, loops, and subroutines. Students issue commands to a "turtle," a triangular cursor on the screen. The commands direct the turtle to draw shapes and designs. Turtle Tracks includes commands similar to both Logo and BASIC and, therefore, serves as a good introduction to either of these programming languages.

Sample commands are: DF10 (Draw Forward 10 steps), TL (Turn Left), JF20 (Jump Forward 20), GT (GOTO), and GS (GOSUB). My students particularly like creating their own commands and making the turtle "sing".

The documentation is thorough in explaining both the mechanics and the philosophy behind turtle graphics. After completing the 10 lessons in the guide, students are more than ready to move on to advanced programming techniques.

Hardware: PET; VIC-20; Commodore 64; Atari 400/800; Apple II; TI 99/4A
Price: $30
Policies: $10 backup; 30-day preview
Source: Scholastic Inc., 904 Sylvan Ave., Englewood Cliffs, NJ 07632

Evelyn Sullivan
Reading Teacher
Williamstown, MA 01267

ELEMENTARY VOLUME 3

SUBJECT: SOCIAL STUDIES, MATH
LEVEL: GRADES 4–6
MACHINE: AP

ELEMENTARY VOLUME 3 consists of several drill and practice and simulation programs for social studies and math, but the most outstanding are *Sell Apples, States 2,* and *Lemonade.* In *Sell Apples,* students must determine the most profitable price for selling apples. Each "day" of selling, students choose a price, and the computer issues a report on the profits (or losses). After five days, a table summarizes all the data, and students either decide on the best price or sell apples for additional days to obtain more data.

Lemonade is a similar program for learning the laws of supply and demand, using a lemonade stand as a prop. I use both these games to teach graphing and plotting and sharpen arithmetic skills.

States 2 drills students on the spelling and naming of state capitals.

All programs come with lesson plans, exercises and worksheets.

Hardware: Apple II
Price: $38 (disk)
Policies: 1 free back-up; previewing
Source: MECC, 2520 Broadway, Minneapolis, MN 55113 (Also available from Sunburst Communications, 39 Washington Ave., Pleasantville, NY 10570.)

Barbara Devir
6th grade teacher
Peekskill, NY

ARITH-MAGIC

SUBJECT: MATH
LEVEL: GRADES 3–9
MACHINE: AP PT TRS

Better than the average drill and practice program, *Arith-Magic* consists of three challenging math skills games. In "Diffy," elementary students choose four numbers—4, 10, 8, and 15, for example—which are then placed in each corner of the screen. Students subtract the pairs of numbers going clockwise around the screen, in this case resulting in 6 (10–4), 2 (10–8), 7 (15–8), and 4 (8–4). These four differences become corner numbers for a new round of "Diffy." The object is to play as many rounds of "Diffy" as possible before all the differences equal zero.

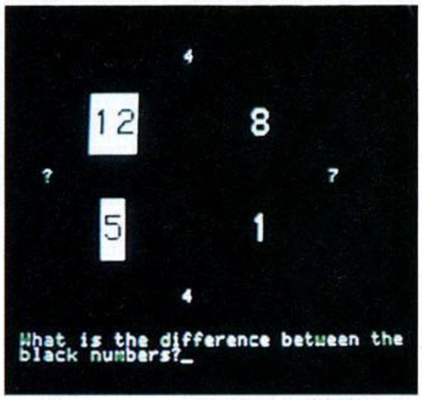
For intermediate students, "Tripuz" presents a similar challenge using six numbers in a triangle, three of which are hidden. The missing numbers are either parts of multiplication or addition problems, which students must solve to complete the puzzle.

"Magic Squares" requires students to use number patterns, averages, and sequences to fill in the missing parts of a 3 × 3 magic square (a square in which the rows, columns, and diagonals all add up to the same sum).

Written for computer novices, the documentation contains follow-up activities, classroom tips, and detailed instructions on how to run the program.

Hardware: Apple II; PET; TRS-80 Models I/III
Price: $35 (disk)
Policies: User makes back-ups; 30-day preview
Source: Quality Educational Design, PO Box 12486, Portland, OR 97212

Patti Littlefield
Education Specialist
Fremont, CA



```
What is the difference between the
black numbers?_
```

Sample round of "Diffy" (*Arith-Magic*).

Continued

Circle 16 on Reader Service Card.

2-Bit Software

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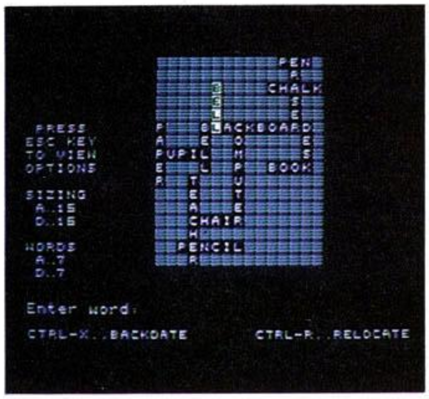


```
 PRESS
ESC KEY
TO VIEW
OPTIONS

SIZING
 A..15
 D..15

WORDS
 A..7
 D..7

Enter word:

CTRL-X..BACKDATE          CTRL-R..RELOCATE
```

Creating a crossword puzzle (*Crossword Magic*).

CROSSWORD MAGIC

SUBJECT: ALL
LEVEL: GRADES K-6
MACHINE: AP AT

CROSSWORD MAGIC automatically generates crossword puzzles based on words and clues entered by teachers or students. Users either select automatic sizing or choose any size puzzle from 3 × 3 to 20 × 20. They can then edit, review, print, store, or simply solve puzzles on screen.

I use *Crossword Magic* for just about every subject area—from famous authors to parts of the body.

In classrooms with only one computer, each student could enter one word with a clue into the computer. After the computer formats a puzzle, teachers could then print out copies for students to complete.

Hardware: Apple II; Atari 400/800; graphics printer optional
Price: $49.95 (disk)
Policies: Free replacements; no previewing
Source: L & S Software, PO Box 70728, Sunnyvale, CA 94086

Cindy Field
Computer Education Consultant
Narragansett, RI

SPELLWRITER

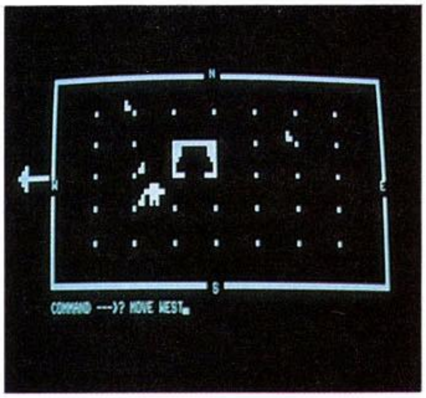
SUBJECT: LANGUAGE ARTS
LEVEL: GRADE 5
MACHINE: TI

SPELLWRITER is the best method I have found in 25 years of teaching to introduce syllable accents aurally and visually. Students phonetically respell words on their spelling list. If they place the accent incorrectly, the speech synthesizer says the word with the accent on the wrong syllable. Students then readjust their phonetic spelling of the word.

Spellwriter is also appropriate for foreign language classes.

Hardware: TI 99/4A with Solid State Speech Synthesizer and Terminal Emulator II
Price: $29.95 (disk); $18.95 (cassette)
Policies: User makes back-ups; previewing through some dealers
Source: Texas Instruments, PO Box 10546, Lubbock, TX 79408

Jack Popovich
5th grade teacher
Youngstown, OH



```
COMMAND --->? MOVE WEST
```

A *Robot Probe* mission. The arrow on the left indicates the robot's direction.

ROBOT PROBE

SUBJECT: PROGRAMMING
LEVEL: GRADES 4–6
MACHINE: TRS

ROBOT PROBE uses a simplified computer language to introduce programming concepts. Students must command a robot to load four lunar probes into a lander and blast off. First-time users start out with single commands, such as TURN RIGHT or MOVE NORTH, which the robot acts out on a grid-like screen. As students become more proficient, they learn to form these commands and others into a single program with line numbers to accomplish the entire mission.

The use of line numbers in the program and commands like RUN, LIST, GOSUB, etc. makes *Robot Probe* a natural for children who will move onto BASIC, and the primitive commands for turning and moving serve as a good introduction to Logo. A paper replica of the screen, a sheet for writing programs, and an easy-to-follow teacher's guide accompany the disk. My students enjoy working independently and are genuinely

excited about seeing their programs animated in graphics.
Hardware: TRS-80 Model III
Price: $49 (disk)
Policies: $10 back-up; 30-day preview
Source: Sunburst Communications, 39 Washington Ave., Pleasantville, NY 10570

Barbara Devir
6th grade teacher
Peekskill, NY

For The Beginner: Purchasing Software

Here is an explanation of some of the terms and procedures described in the Software Showcase:

SOFTWARE FORMS:

Software programs generally come in three forms: disk (the most common), cassette, and cartridge. In the descriptions of each program, the form of the software is listed alongside the price.

HARDWARE REQUIREMENTS:

The hardware descriptions indicate which machines the software will run on. If you are using a PET computer, for example, you would need to purchase a PET version of the program. This section also mentions whether the program requires any additional equipment or more memory than is supplied with the standard computer unit.

BACK-UPS:

Software programs are easily damaged, particularly when they are handled by dozens of young and inexperienced users each day. To safeguard against such a catastrophe, some companies allow users to make copies of a program (called back-ups), many companies include a back-up with the original, and still others charge a small fee for back-ups. A free replacement policy generally means that you may return a damaged disk in exchange for a good copy of the program.

PREVIEWING:

If you are uncertain whether you want to purchase a particular software program, some companies will allow you to preview the program for a limited time before making a purchase, or will allow you to return the program with a purchase order if you are unsatisfied.

Also be sure to check with local dealers and distributors. Even if the producer does not allow previewing, some local dealers set up hands-on software demonstration sessions. □

CALLING ALL WRITERS!

TEACHING AND COMPUTERS invites you to submit articles on your work with students and computers. We are particularly interested in these topics:
- PEER TUTORING
- CLASSROOM MANAGEMENT
- READING INSTRUCTION
- SIMPLE COMPUTER PROGRAMS

Send your article along with a self-addressed stamped envelope to: *Teaching and Computers*, 730 Broadway, New York, NY 10003.

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Carolyn Rutledge, Reading Director Eagle Elem. School, Van Horn, TX
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Judy Henry, LLC Director Rhodes Elem. School, River Grove, IL

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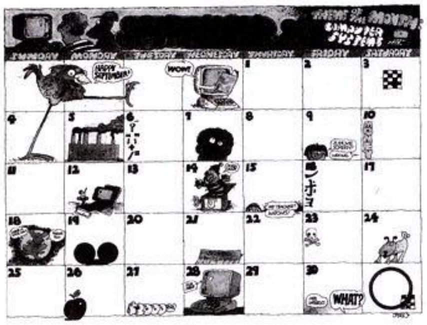
City ____________ State ________ Zip ________ **TC**

Circle 1 on Reader Service Card.

Electronic Calendar-Teacher's Guide

COMPUTING IN SEPTEMBER



by Lorraine Hopping

TEACHING AND COMPUTERS' ELECTRONIC CALENDAR CONtains holiday- and theme-related activities and computer jokes. (This month's theme is computer systems.)

The teacher's guide to the calendar is in two parts. The first part will help you organize the theme-related items into lessons. (Each lesson will list corresponding calendar dates in parentheses.)

The second part will supply answers for holiday-related questions and activities.

PART 1:

COMPUTER SYSTEMS ACTIVITIES

TOPIC: COMPUTER TYPES (9/3)

Display the photos of a micro-, mini-, and mainframe computer collected for the September 3 calendar activity. Make a chart on the chalkboard listing mainframe, minicomputer, and microcomputer in one column and size, speed, cost, memory, and uses in a perpendicular column. Discuss the differences and similarities between these types of computers and fill in the chart accordingly. (See sample.)

Sample Chart:

	MICRO	MINI	MAIN
Size	Small	Medium	Large
Speed	Slowest	Fast	Fastest
Cost	Cheapest	Mid-price	Expensive
Memory	Least	Medium	Most
Uses	Schools; Homes; Small Business	Business; Universities	NASA; Science; Research

TOPIC: INPUT DEVICES (9/6, 9/7, 9/16)

Input devices help computers accept information directly from a user or from a software program. Keyboards, disk drives, and cassette players are the main input units of a computer. Other units include joysticks, light pens, card readers, and a device called a "mouse" (a handheld box for moving the cursor.)

Ask students to identify the input units on this month's miniposter and on the photos of the micro-, mini-, and mainframe computers.

Related Activities: For keyboard activities, see "Learning Center," on page 26 of this issue.

TOPIC: OUTPUT DEVICES (9/9, 9/11, 9/16)

Output devices display processed information from the computer. Printers and monitors (CRTs) are the common output devices of a computer. Ask students to identify these units on the poster and in the photos of the three types of computers. Discuss whether a modem, a device that allows computers to receive and transmit information over the phone lines, is an output or input device. (It's both: information flows out one computer through a modem and into another computer through a modem.)

TOPIC: THE CPU (9/13, 9/23)

The CPU processes all information entered into a computer. Students can better understand how the CPU works by comparing it to how their brain works. Write a math problem, such as $3+7$, on the board. Explain that the problem enters the brain through the eyes. The brain then "processes" the information (solves the problem), and the answer, 10, is sent out through the fingers or mouth. Compare the following parts: 1. Eyes and keyboards (input) 2. Nerves and integrated circuits (input/output) 3. Brains and CPUs (processing) 4. Fingers and printers or monitors (output) and 5. Mouths and speech synthesizers (output). Discuss both similarities and differences.

Related Activities: For more information on CPUs, see "Close Encounters," page 15.

TOPIC: REVIEW OF COMPUTER SYSTEMS (9/27, 9/30)

To play the Computer Hardware Game, divide the class into users, input devices (a keyboard and disk drive), output devices (a printer and monitor), and the CPU. Each student plays a role. Users prepare math problems, messages for the computer to print out, and other tasks a computer can do.

Students form a circle, with the "printers" nearest the chalkboard. Users "input" math problems and other tasks by passing slips of paper to the input devices, one at a time. In advanced classes, these "input devices" can then translate the math problems into binary; otherwise they must read out loud the information to the "CPU." The "CPU" then processes the information (solves the math problems mentally, or reads out the messages) and tells the outcome to the "output devices." "Printers" write the results on the chalkboards and "monitors" write out the results and hold them up.

PART 2:

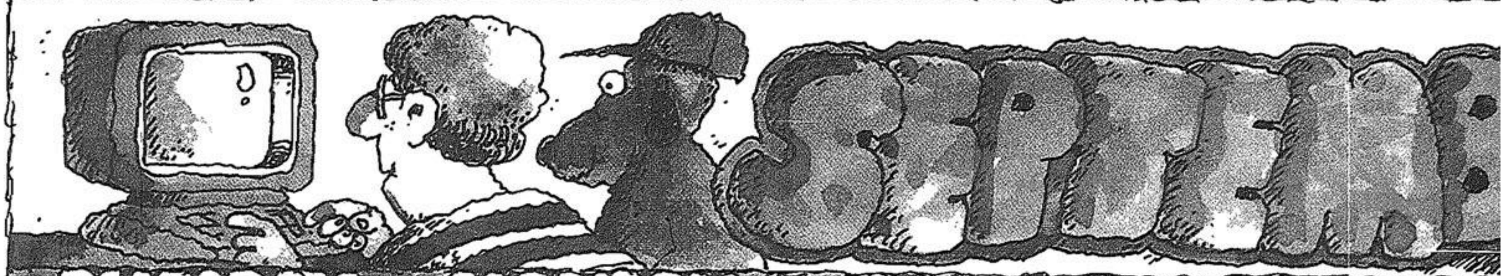
ANSWERS TO OTHER CALENDAR QUESTIONS

September 15: Many robots have electronic sensors that permit them to see, hear, touch, smell, and taste.

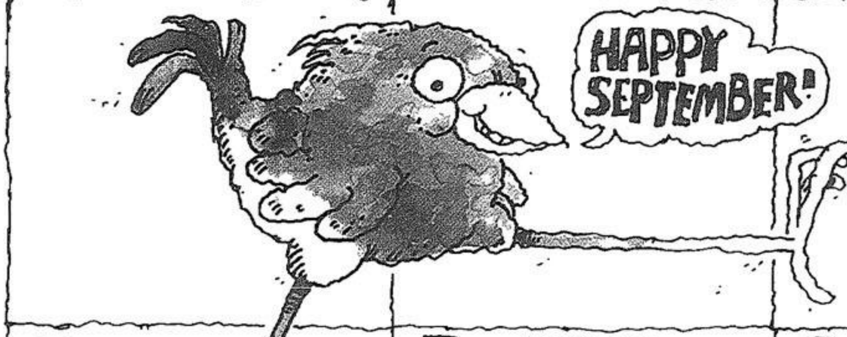
September 19: Cartoonist can generate detailed images on the screen and change a single part to make them move.

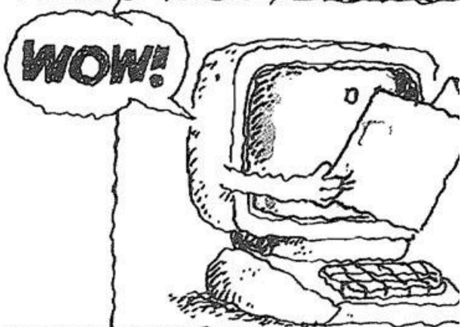
For more information on graphics and computers, try these books: *Computer Art and Animation for the TRS-80*, by David Heiserman (Prentice Hall) and *Artist and Computer*, by Ruth Leavitt (Crown Publishers).

September 29: Some computer crimes involve people stealing money from computerized bank accounts and vandals destroying programs or computer systems for kicks. Two books on computer crime are: *Computer Crime*, by August Bequai (Lexington Books) and *Fighting Computer Crime*, by Donn B. Parker (Scribner). □



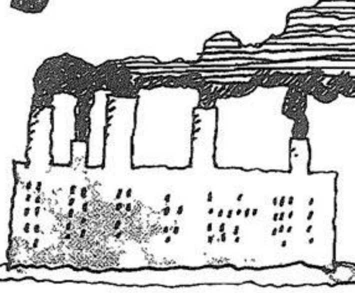
SUNDAY MONDAY TUESDAY WEDNESDA


HAPPY SEPTEMBER!



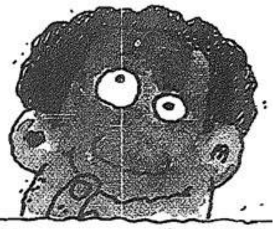
4

5 LABOR DAY



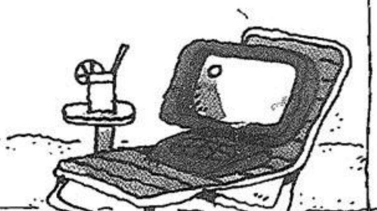
6 Activity Day A computer keyboard is used for putting information into a computer. That's why it is called an "input" unit. On a real keyboard or a paper copy, type your name as fast as you can. Practice typing these symbols: ? " " ; . + - - /

7 Quick Quiz: How are disk drives and cassette players alike?



11 Word of the Day: PRINTOUT
A printer prints out information on paper. The result is a "printout." Find five examples of computer printouts (bills, "junk mail", magazine labels, etc.)

12 Where did the computer go for vacation?
On a trip down Memory Lane.



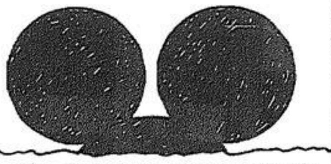
13 Word of the Day: CPU
The CPU (or Central Processing Unit) is the "brain" of the computer. Think about how your brain solves problems. Where does the information come in? How do you get the answer? Where does the answer go out?

14

18 WORLD PEACE DAY

HAVE A NICE DAY.
THANK YOU.

19 Mickey Mouse's birthday: 1928. Did you know that artists can use computers to create cartoons?



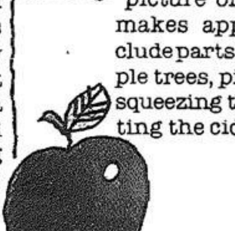
20

21 Why did the comput buy a calendar?
It wanted to know t data.

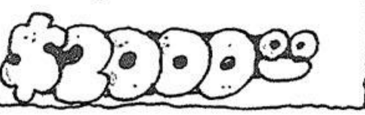
Jason Combs, West Ca rollton, OH

25 Today is the 268th day of the year. Figure out how many days are left in 1983. How many days old are you? How many days until your next birthday? If you have a calculator—a special computer for doing math problems—use it to do these problems.

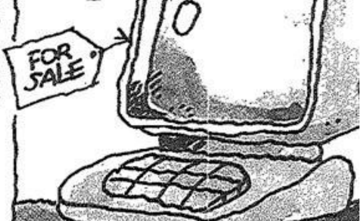
26 Johnny Appleseed's birthday: 1774. Draw a picture of a robot that makes apple cider. Include parts for finding apple trees, picking apples, squeezing them, and putting the cider in bottles.



27 Activity Day: If you had $2000 to buy a computer system, what would you buy? Check newspaper ads for computer brands and parts. What would you use the computer for?

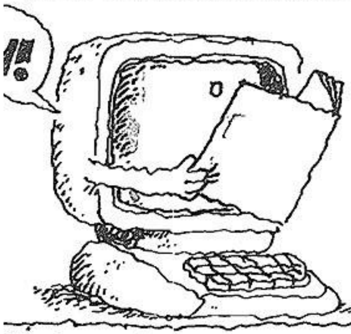
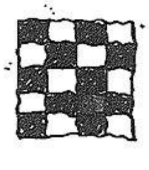
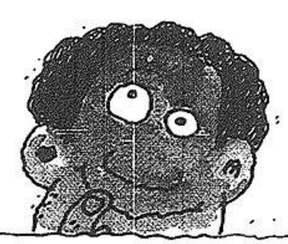
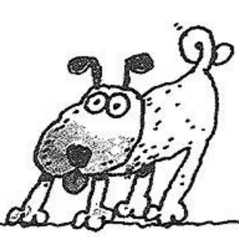
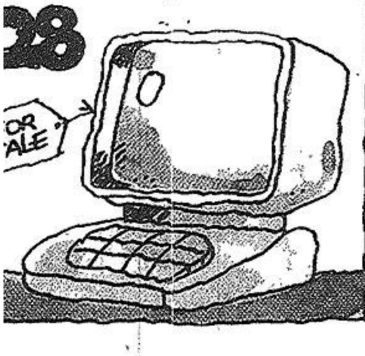
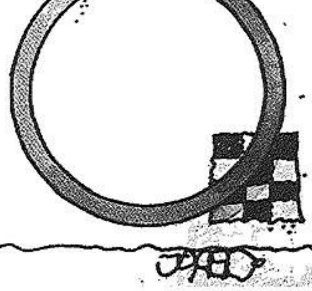


28

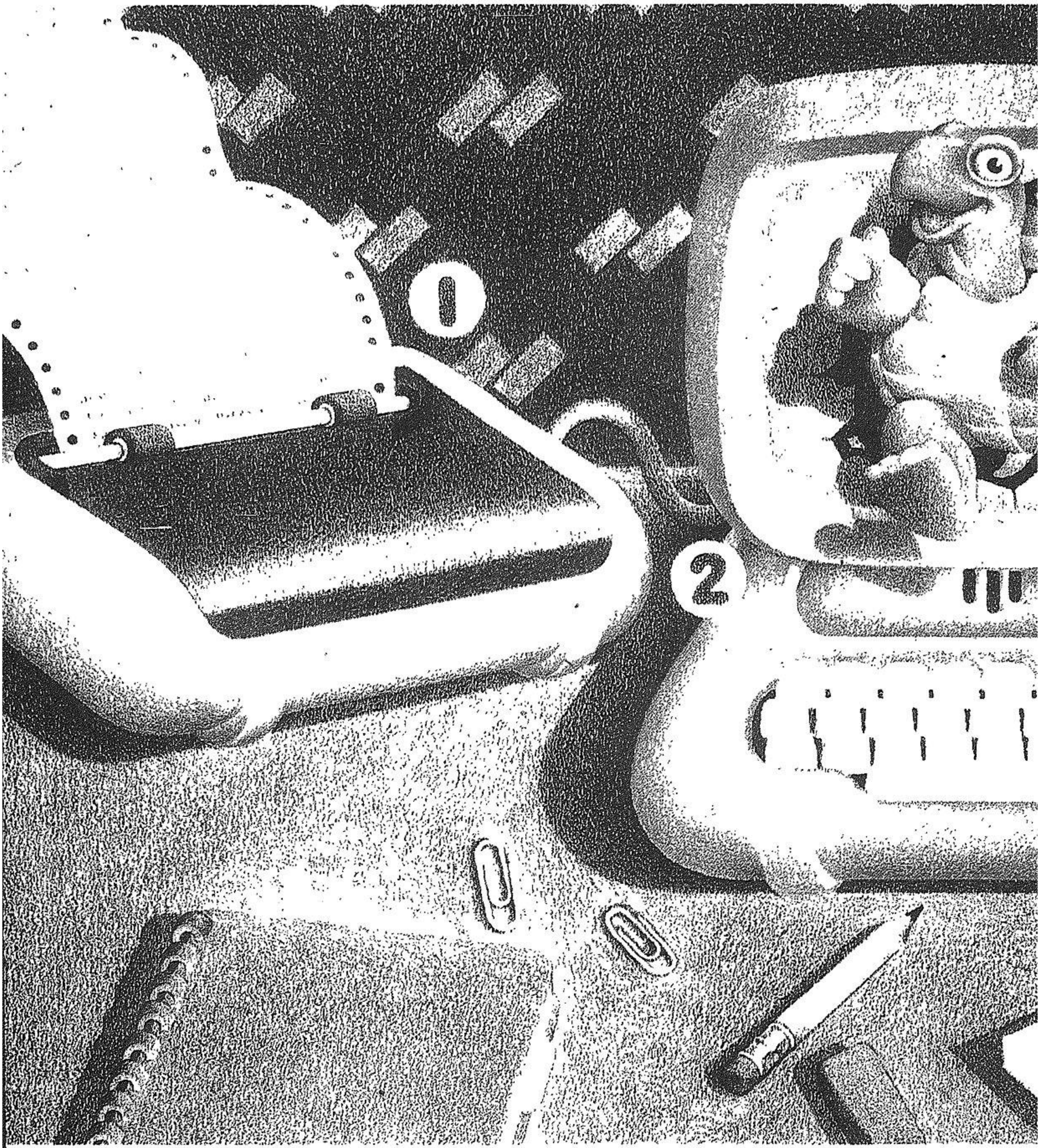


EMBER 83

THEME OF THE MONTH: COMPUTER SYSTEMS

WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
	**1** September is Read a New Book Month How about reading a new computer book! Try *Katie and the Computer* by Fred D'Ignazio or *Computers are Fun* by Jean Rice and Sandy O'Conner	**2** Activity Day. Cut out a picture of a main frame, minicomputer, and microcomputer from newspaper or magazine ads How are these computers different? Compare their sizes, speeds, costs, and amounts of memory storage	**3** 
7 Quick Quiz: How are disk drives and cassette players alike? 	**8** ROSH HASHANAH	**9** Quiz Day CRT and video display are both words for the screen where information is displayed. What's another word for this screen? A MOVIE SCREEN? WRONG.	**10** MONEY Swap Ideas Day. Want to swap jokes? Think of a computer joke like the ones in this calendar. Send it to Teaching and Computers, 730 Broadway, New York, NY 10003. You could make $5 for each joke we publish
14 	**15** Mystery writer Agatha Christie was born today in 1890. Can you solve this mysterious riddle? What can see without eyes, hear without ears, smell without a nose, touch without fingers, and taste without a tongue? MY TEACHER? WRONG!	**16** ンポヨ MAYFLOWER DAY Activity Day: A modem lets you send information from one computer to another—over the telephone lines! If you could send a message to a student in Japan, what would you say?	**17** YOM KIPPUR
21 Why did the computer buy a calendar? It wanted to know the data. Jason Combs, West Carrollton, OH 	**22**	**23** FALL BEGINS Fast Fact: The CPU is made up of computer chips and circuits. Did you know that computer chips have arsenic (a poison) in them? They also have gold, aluminum, argon gas, and silicon in them. 	**24** 
28 	**29** On this day in 1829, Scotland Yard in London became the office of the London Police Force. How could people use computers to commit crimes or destroy things? How would you stop them?	**30** Activity Day: Play The Computer Hardware Game. Ask your teacher for instructions. MRS WEEBLES. WHAT?	

WHAT ARE THE PARTS



1 Printer
Shows on paper the work
a computer has done.

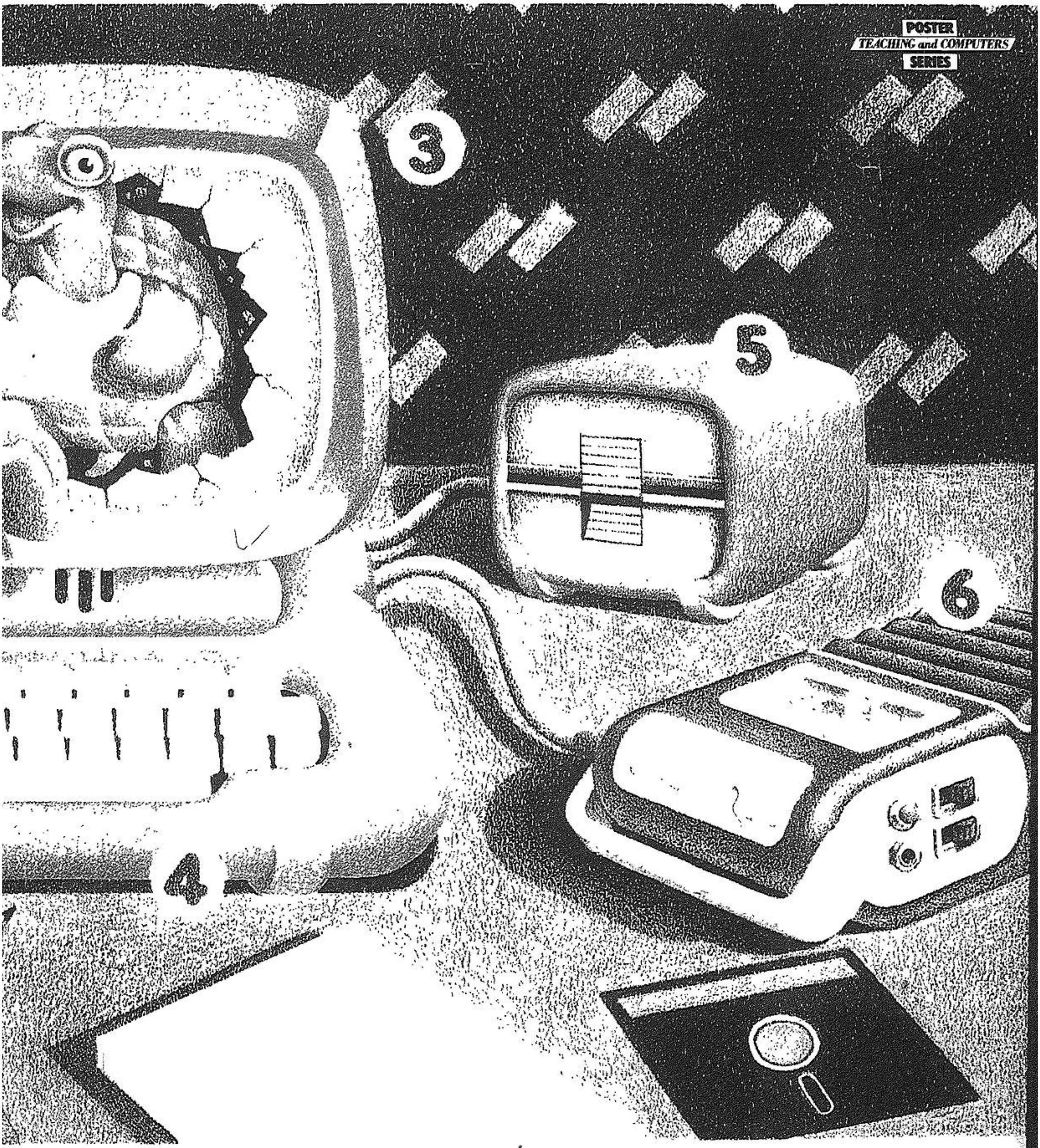
2 CPU
The place where the computer
does its work.

3 Monitor
A screen that shows work
a computer has done.

4

PUBLISHED BY SCHO

RTS OF A COMPUTER?



POSTER
TEACHING and COMPUTERS
SERIES

work
:

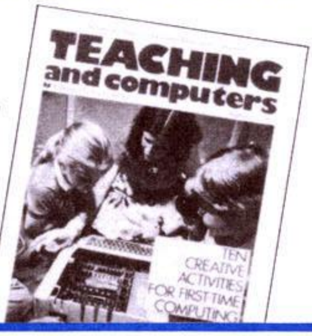
4 Keyboard
Enters information into a computer.

5 Disk Drive
Stores or enters information by using a disk.

6 Tape Recorder
Stores or enters information by using a cassette tape.

BLISHED BY SCHOLASTIC INC.

For more information about the products and services advertised in this issue...



1. Selectively circle the numbers on the reply card.

2. Check the appropriate answers to the reader classification questions.

3. Be sure to fill in your name, school, and address. (Incomplete information will void the card.)

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TEACHING and computers

September 1983
(Expires November 1)

READER SERVICE CARD

Please circle an entry for each category.

I. Level (check one)
- ☐ a. Elementary (k-6; k-8)
- ☐ b. Middle School
- ☐ c. Junior High
- ☐ d. Senior High
- ☐ e. Junior/Senior
- ☐ f. College
- ☐ g. District
- ☐ h. State
- ☐ i. Federal/National
- ☐ j. Other

II. Your primary job (check one)
- ☐ 1. Administrative (including Superintendent/Principal)
- ☐ 2. Teaching (including Department Head)
- ☐ 3. Evaluation/Purchasing
- ☐ 4. Curriculum Development
- ☐ 5. Media Specialist/Librarian
- ☐ 6. Other

III. What is your primary involvement with computers?
- ☐ a. Actively use computers
- ☐ b. Recommend type/brand
- ☐ c. Approve purchase
- ☐ d. General interest
- ☐ e. All of the above

IV. Your school or district's investment in electronic learning materials.
- ☐ 1. Increasing
- ☐ 2. Decreasing
- ☐ 3. No Change

V. In which area does your school or district use computers? (check one)
- ☐ a. Interdisciplinary (elementary classroom)
- ☐ b. Math
- ☐ c. Reading
- ☐ d. Science
- ☐ e. Business/Vocational Education
- ☐ f. Computer Sciences
- ☐ g. Social Sciences
- ☐ h. English/Language Arts
- ☐ i. Other

VI. How does your school or district use computers?
- ☐ 1. Primarily for administrative purposes
- ☐ 2. Primarily for instructional purposes

VII. What type of software has your school/district purchased in the past year?
- ☐ a. Curriculum-based courseware
- ☐ b. Fun/Learning software
- ☐ c. Word Processing
- ☐ d. Utility
- ☐ e. Programming

VIII. Your school/district enrollment
- ☐ 1. Under 300
- ☐ 2. 300–499
- ☐ 3. 500–999
- ☐ 4. 1000–4999
- ☐ 5. 5000–9999
- ☐ 6. 10,000–24,000
- ☐ 7. 25,000 +

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Name ____________________

School or Office ____________________

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City __________ State __________ Zip __________

TEACHING and computers

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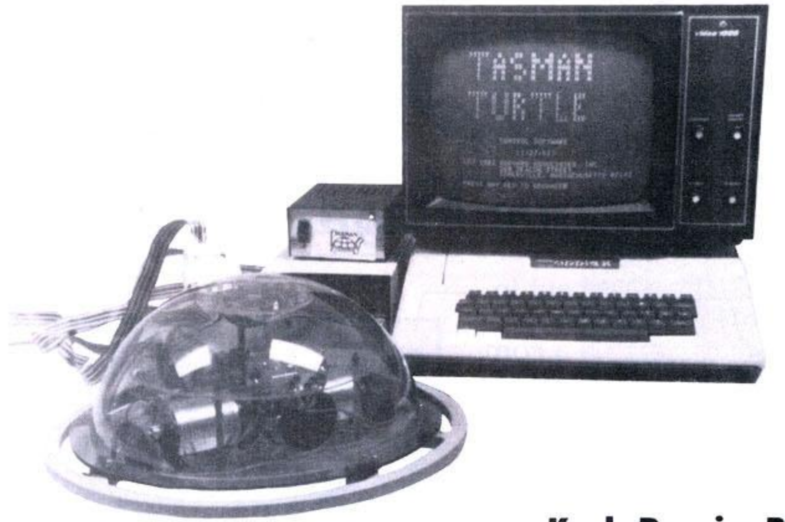
Tools of the Trade



Tasman Turtle

The Tasman Turtle is an educational robot that teaches programming skills. It moves, turns, draws, blinks, beeps, feels its surroundings with its touch sensors, and even talks and uses an electronic compass!

The Turtle comes assembled and ready to use with its own software created for inexperienced computer users. You can control the Turtle with BASIC, Logo, and other computer languages. It is available in both Apple II and RS-232 port versions.

Price: $999.95 for Basic Tasman Turtle both versions, more for Talking Turtle and Turtle with Electronic Compass. Contact: Harvard Associates, 260 Beacon Street, Somerville, MA 02134; 617/492-0660.

(Circle 105 on Reader Service Card.)

Koala Drawing Pad

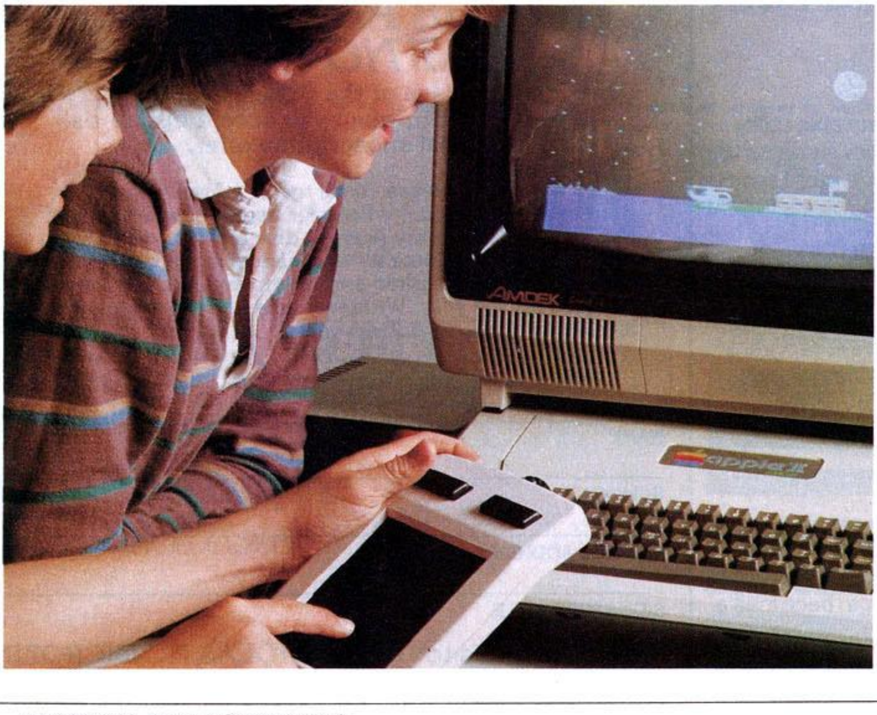
You are an instant artist with the Koala Pad touch tablet. It is a handheld electronic pad that plugs into your microcomputer and lets you draw directly on the screen with your finger.

Koala comes with a software menu that lets you select shapes, shadings, brush strokes, and colors. As you use these elements to draw on the pad, images appear on the screen.

Koala Pad can be used with Koala software games as well. To play these games, students draw on the pad instead of operating a keyboard. This feature is particularly helpful for young children who can't use a keyboard well.

You can use the Koala Pad with Apple, Atari, IBM, and Commodore computers. *Price: $125. Contact: Koala Technologies, Corp., 1800 Embarcadero Road, Palo Alto, CA 94303; 415/494-2030.*

(Circle 108 on Reader Service Card.)



VIK-Dubber for Commodores

If you own a Commodore 64 or a VIC-20 microcomputer, a new device will let you save and load information in a standard cassette recorder. Called the VIK-Dubber, it allows you to connect two cassette recorders together and make back-up copies for your files. The VIK-Dubber is powered by the computer, so batteries aren't necessary.

Price: $34.95. Contact: Bytesize Micro Technology, P.O. Box 21123, Dept. BH, Seattle, WA 98111; 206/236-2983.
(Circle 101 on Reader Service Card.)

New Texas Instruments Devices

If you own a Texas Instruments computer, two new devices might help you get more from your machine. The HX-1100 Video Interface lets Compact Computer 40 owners use a television or a Texas Instruments video monitor. The HX-3100 modem allows owners of the Compact Computer 40 and TI 99/4A to send and receive information on telephone lines.

Price: $99.95 each. Contact: Texas Instruments, P.O. Box 53, Lubbock, TX 79408; 800/858-4565.
(Circle 103 on Reader Service Card.)

Save More on your Floppy Disk

If dual density disks give you double the memory, imagine the amount of information you can store on Inmac's new quad density 5 and ¼ inch floppy disks. They give you double the memory storage of dual density disks. And you can use them with Basic 4, Commodore, and Texas Instruments high capacity drives.

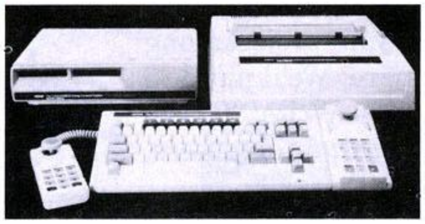
The Inmac Plus has 80 tracks and holds 327,680 bytes of information. Both single and dual sided versions are available.

Price: $6.80 for single-sided disk, $8.95 for double-sided disk. Contact: Inmac, 2465 Augustine Drive, Santa Clara, CA 95051; 408/727-1970.
(Circle 104 on Reader Service Card.)

Speech Module for Commodore

Now Commodore 64 computers can talk and sing! The new speech module features a 235-word vocabulary and allows you to select the voice speed. You can program music, graphics, and speech simultaneously.

Price: $99.95. Contact: Commodore Business Machines, Inc., 1200 Wilson Drive, West Chester, PA 19380; 215/431-9100. *(Circle 102 on Reader Service Card.)*



Introducing the Adam Computer System

Coleco's new family computer system is the first microcomputer with a letter-quality printer for under $600. If you're looking for a lot of options for your money, this system may be for you. Adam's features include 80K of memory (expandable to 144K), and a 75-key typewriter style keyboard with a built-in word processor.

Coleco plans to offer popular CP/M programs on digital data packs, along with additional educational software designed for Adam's digital data pack drive. Adam also accepts ColecoVision video game cartridges.

The package includes two game controllers and an arcade game package.

Price: $600. (You can buy Adam as an expansion module for the ColecoVision video game system for $400.) Contact: Coleco Industries, Inc., 945 Asylum Avenue, Hartford, CT 06105; 203/278-0280.
(Circle 106 on Reader Service Card.)

MicroColor Computer Has Graphics in Eight Colors

The new Radio Shack TRS-80 Micro Color Computer (Model MC-10) gives you low-resolution graphics in eight colors. It has 4K of memory and a standard keyboard. The Micro Color Computer hooks up to your TV set and uses a cassette recorder. Software written specifically for the MC-10 will be available soon.

Price: $119.95. Contact: Radio Shack/ Tandy Corp., 1800 One Tandy Center, Fort Worth, TX 76102.
(Circle 107 on Reader Service Card.)

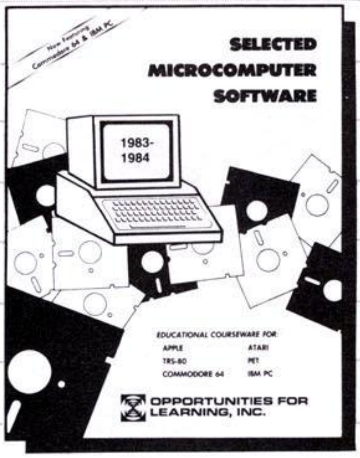
WHAT'S HAPPENING IN *YOUR* CLASSROOM?

Is your class working on an exciting computer project? If so, we'd like to tell our readers about it in *Teaching and Computers'* monthly column, "Classroom Happenings."

Send a brief description of your project along with any photos you can spare. We'll pay $25 to $50 if we publish your story. Write: "Classroom Happenings," *Teaching and Computers*, 730 Broadway, New York, NY 10003.

CIRCLE 10 ON READER SERVICE CARD

LOOKING FOR THE RIGHT COURSEWARE?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READINESS REPRODUCIBLES

Three worksheets for primary students

The next three pages are worksheets that introduce primary children to computers. Tear them out, run them off, and you have a lesson on computer awareness!

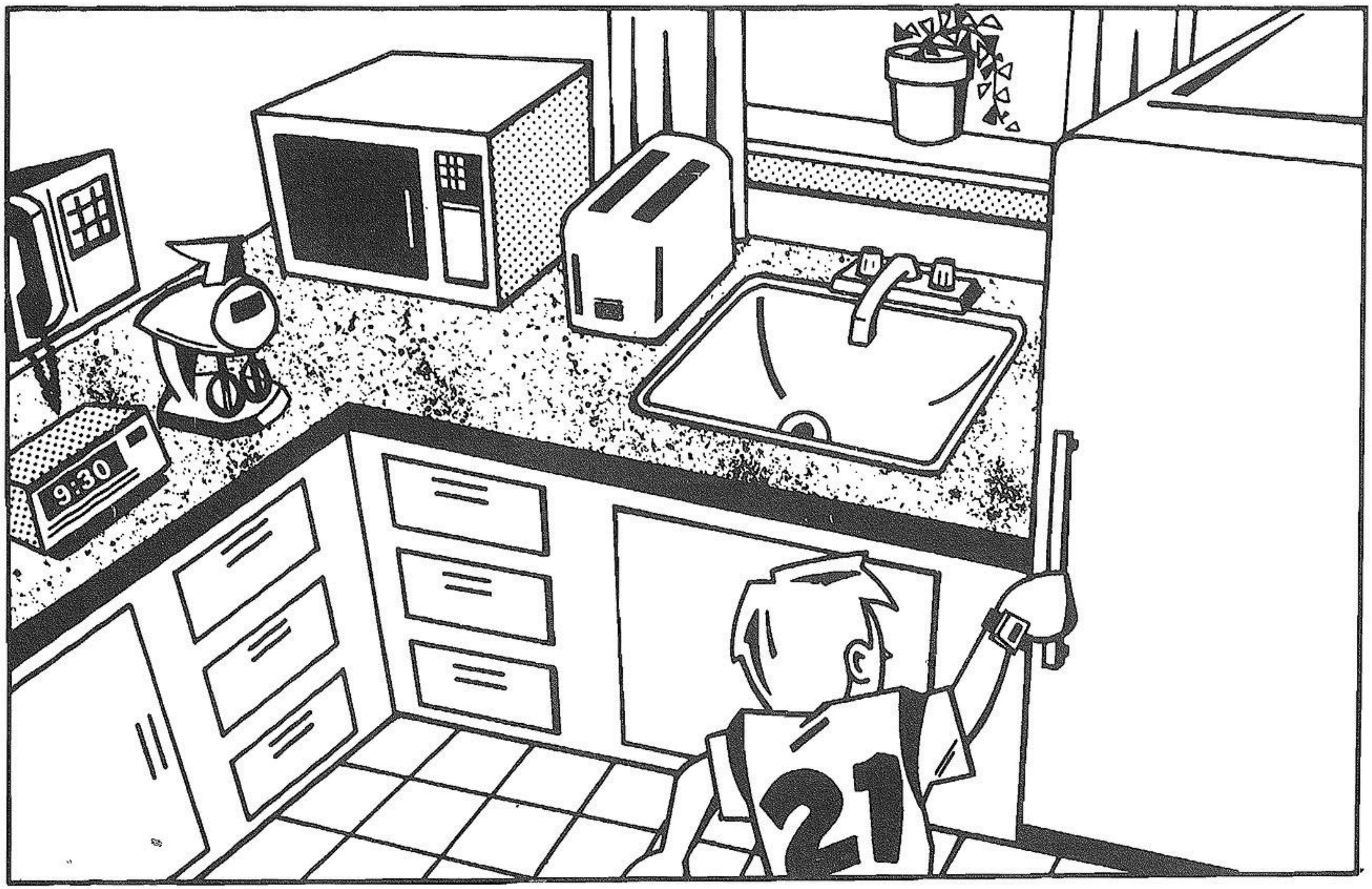
In the first sheet, Find the Computers, children are to put a ring around the objects in the picture that use computers. Help them recognize that information on computer chips (microprocessors to be exact) can control time and temperature, and can even store and dial phone numbers. Students will soon conclude that computers are used in many machines. On this worksheet, they should circle the microwave oven, the refrigerator, and the digital clock, watch, and telephone.

The second sheet, Computers at Work, shows pictures of work places that use computers. Students are to draw a line from each work place to its name.

At this point, discuss with children how computers are used in work places to calculate. They calculate money transactions in banks, the path and speed of airplanes at control towers, food bills at stores, and gas charges at service stations. Computers are also used in work places to store information. For example, they store card catalog information at libraries and money transactions at banks.

In the last sheet, Learn the Keyboard, children are asked to locate missing letters on a computer keyboard. Computer keyboards differ from model to model. If your keyboard varies a great deal from the keyboard on this worksheet, you may wish to pencil in a few alterations before you reproduce the page. Letter keys on this sheet should appear in this order: top row, left to right—q, w, e, r, t, y, u, i, o, p; middle row left to right—a, s, d, f, g, h, j, k, l; and bottom row, left to right—z, x, c, v, b, n, m.

Name______________________



Find the Computers

Many machines use computers.
Put a ring around the machines that use computers in this picture.
Color the picture.

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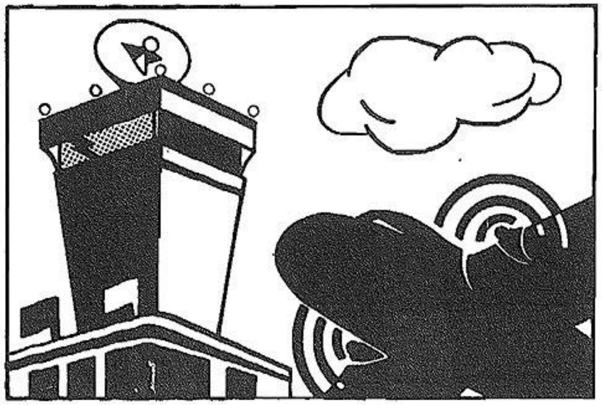
Teaching and Computers Magazine, Scholastic Publications, Ltd

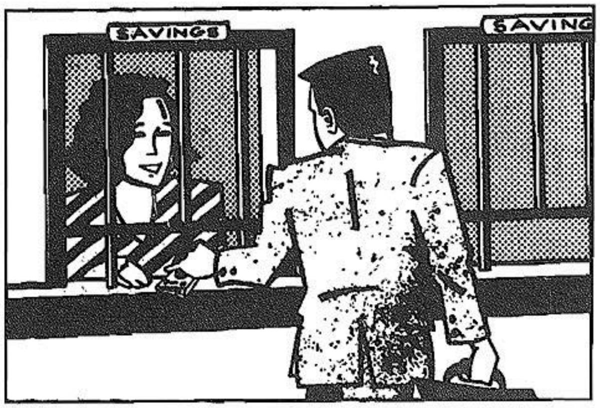
Name______________________

COMPUTERS AT WORK

These pictures show
work places where
computers are used.

Draw a line
from each work place
to its name.



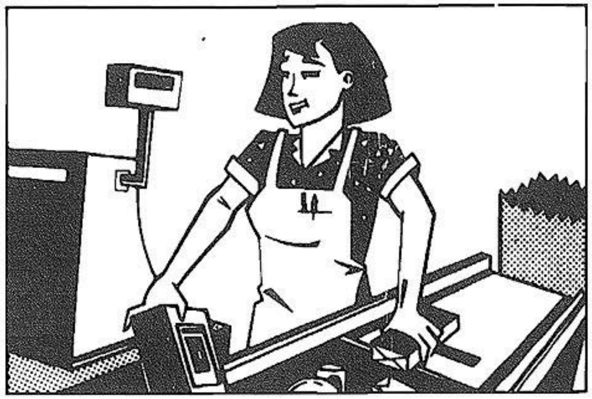


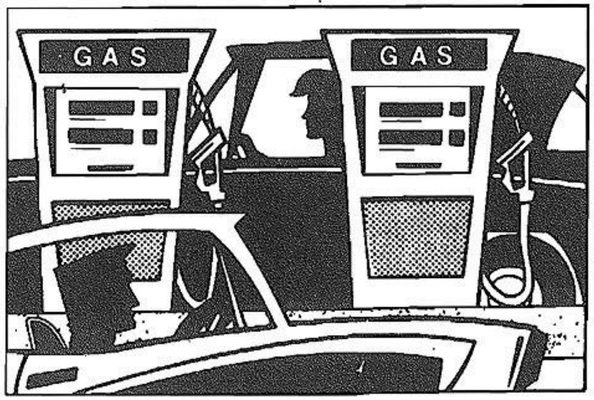
GAS STATION

AIRPORT

BANK

FOOD STORE





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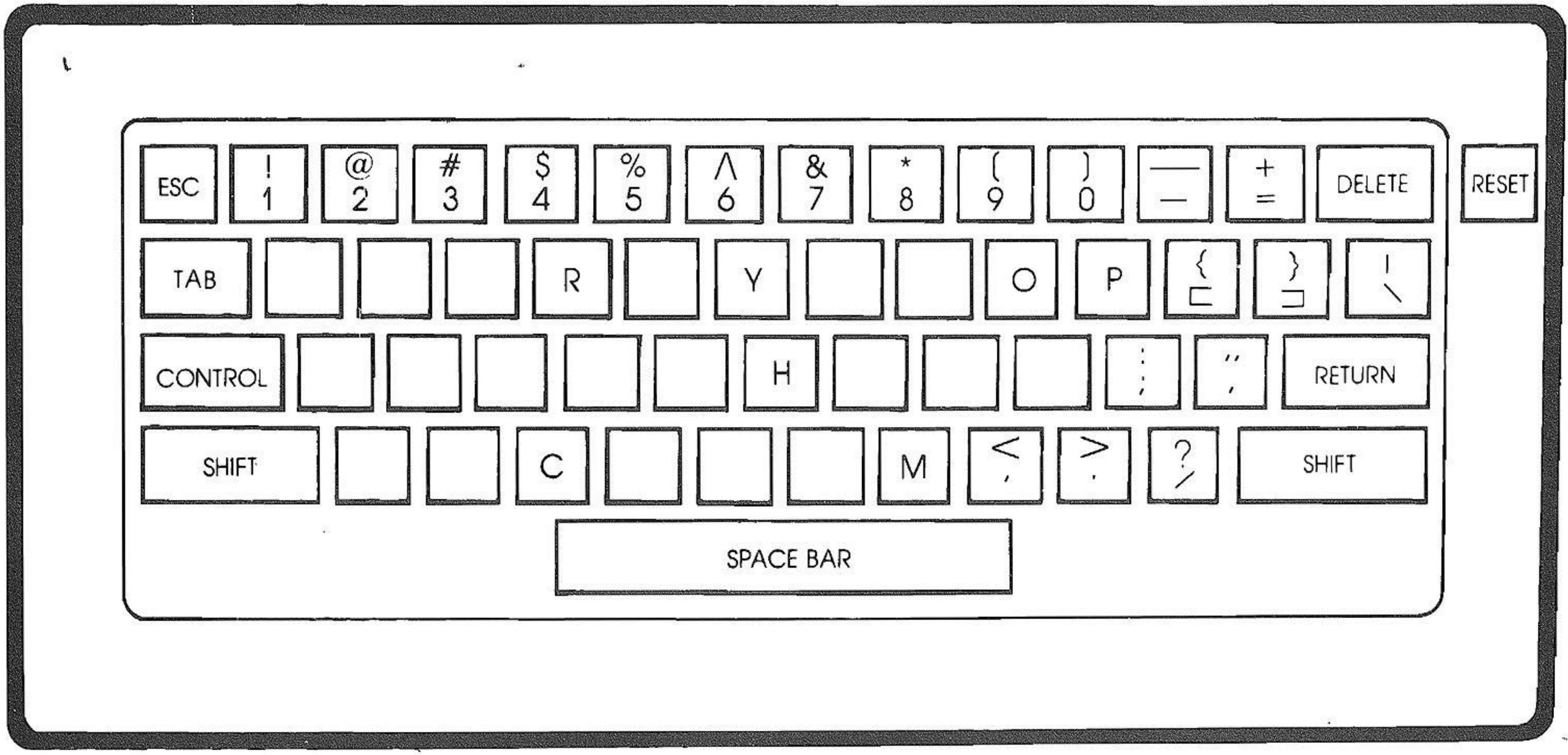
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SPACE BAR

LEARN THE KEYBOARD

Fill in the missing letters in the keyboard
If you need help, look at the keyboard on a real computer.

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Bookshelf

by Judy Simmons

LIKE DUCKY LUCKY, Cocky Locky, and Henny Penny, some of us feel as if the sky were falling; from all directions we are being bombarded with computer books!

Even with dozens to choose from, finding good reference books on microcomputers in education is difficult. ***Microcomputers in Education: A Handbook of Resources*** by Katherine Clay (Oryx Press; 1982; $18.50) is a good starting point. Clay has assembled an annotated bibliography of articles on future trends, computer literacy, philosophy, classroom and management applications, evaluation criteria, inservice, research, home computers, and resources.

Be sure not to overlook the valuable appendix of computer journals, software vendors, and microcomputer centers at the end.

Another good reference tool is James Thomas' ***Microcomputers in the School*** (Oryx Press; 1981; $27.50 Cloth; $22.50 Paperback). Besides the bibliographical listings, Thomas' book also contains reprinted articles and essays in four logically sequenced sections: Considerations in Selection, Hardware and Software Development, Applications in the Curriculum, and Trends and Issues.

The reprinted articles are fairly current (1979-81) and are helpful to novices and computer literates alike.

The appendices are as useful as the main text. They consist of a glossary of computer terms, resources for computers, software, magazines, clubs, and organizations.

If you're looking for some practical advice on the "do's" and "don'ts" of using hardware and software, try ***Don't (Or How to Care for Your Computer)*** by Rodnay Zaks (Sybex; 1981; $11.95). Zaks does a good job not only of explaining what to do, but also explaining why.

The book covers all computer components—the CPU, monitor, printer, disks, cassettes, etc. —and does it in simple, nontechnical language. Even just a few minutes with *Don't* would probably save you both down time and money.

If you're looking for a similar book on computer operations for your students—ages 9 to 12 —then you're like Patricia Schillingburg three years ago. Unable to find suitable material, Schillingburg wrote it herself: ***Kids Can Touch: A Child's Guide to the Apple II Plus Computer*** (Schillingburg; 1981; $4.95).

The book begins with a simple "let's get acquainted with the computer" approach, introducing the basic computer components and explaining how to run a prepared program. It then introduces simple programming and a brief history of computers and their impact on society. Clever illustrations help make *Kids Can Touch* an enjoyable and informative resource.

A Teacher's Guide to Teaching BASIC in the Elementary Schools, by Elaine David (E. David and Associates; 1982; $9.95) does for teachers what Schillingburg's book does for kids. *Teaching Basic* provides a step-by–step guide for teaching simple programming involving arithmetic operations. The main text is for the TRS-80 models, but footnotes provide conversions for Apple and PET computers.

The programs are arranged from easiest to hardest, with 32 additional activities challenging students to alter various programs. By following this guide, teachers can expect students to create programs that figure the perimeter and area of a rectangle, the area of a right triangle, grade averages, conversions to and from Centigrade and Fahrenheit, etc.

A good children's book on programming—one that doesn't turn kids off with pages of program listings—is Brian R. Smith's ***Introduction to Computer Programming*** (Usborne; $9.95 Hardcover, $3.95 Paperback).

The bright, bold, and colorful illustrations and easy-to-read format are sure to capture students' interest and make programming an adventure.

Small robots and video cartoon characters help explain graphics, loops, and subroutines, while fundamental BASIC commands are presented on attractive two-page spreads. The book includes debugging tips, exercises, and sample programs along with a helpful glossary, bibliography, and index.

Judy Simmons is a librarian at the Robert E. Lee Elementary School in Denton, Texas.

programmer s

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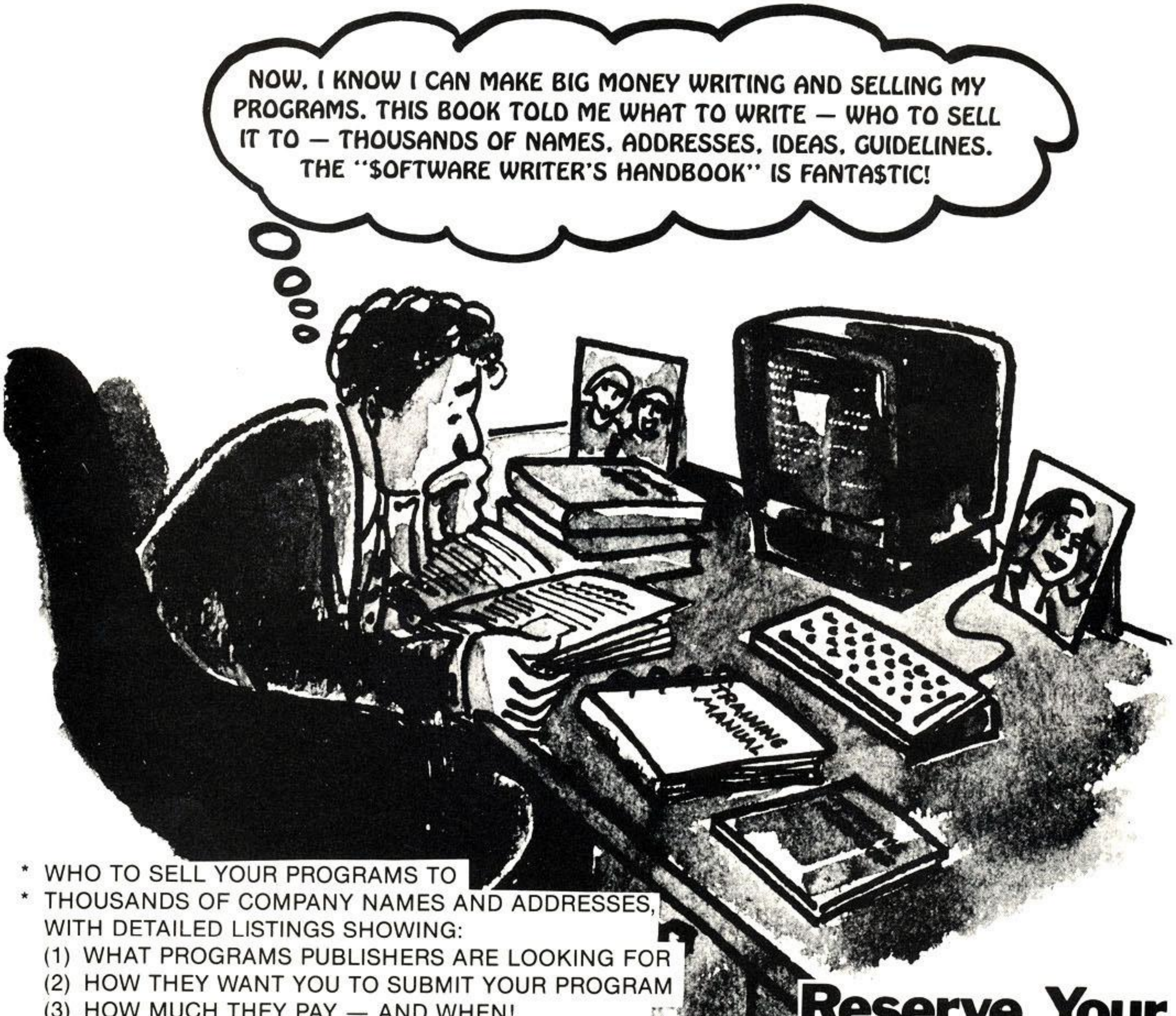
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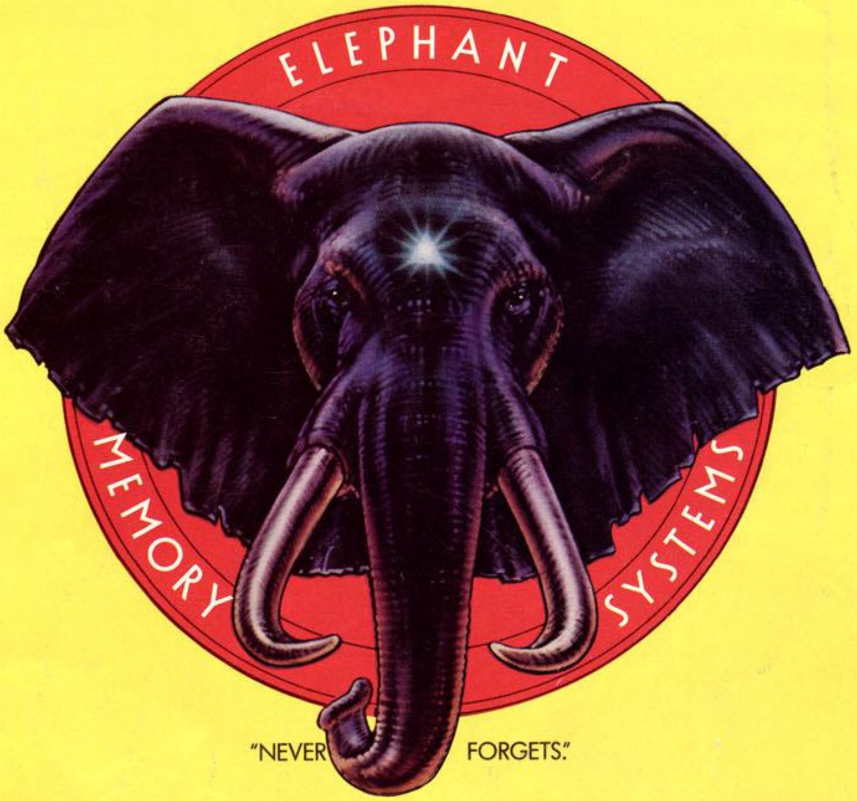

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